



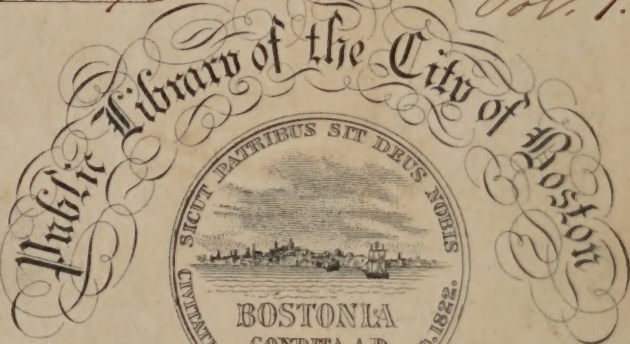
Accessions

PROPERTY OF THE

★ 3847.73

268.043

Vol. 1.



From the Bates Fund.
Added Nov. 7. 1879.

For assistance please consult Library Staff.

OCT 18 3 21 PM '54

REPORT

- ☐ Copies.....
- ☐ Out
- ☐ Bindery
- ☐ Missing
- ☐ Not on Shelf.....
- ☐ In.....
- ☐ Please consult Library Staff
for further information

Attendant's Initials:





Verlag von F. Tempsky

Lithografie & Druck der Actien-Gesellschaft, Bohemia, Prag

MONTBLANC

ALPINE PLANTS

PAINTED FROM NATURE

BY

JOSEPH SEBOTH,

EDITED BY

ALFRED W. BENNETT, M.A., B.SC., F.L.S.,

Lecturer on Botany to St. Thomas's Hospital.

WITH INTRODUCTION BY

F. GRAF, of Graz.

VOL. I.,

CONTAINING 100 PLATES.

LONDON:

W. SWAN SONNENSCHN & ALLEN,
PATERNOSTER SQUARE.

3847.73
vol. 1.

Ms.

268.043

Nov. 7. 1879



PREFACE TO THE ENGLISH EDITION.

IN presenting the accompanying work to the English public, it should be mentioned that M. Graf, the Director of the Botanic Garden at Gratz, died before he had been able to complete it, the thread being then taken up by his successor, M. Petrasch. The whole work has had the advantage of the careful supervision of perhaps the best living authority on Alpine plants, Professor Kerner, formerly of Innsbrück, now of Vienna—a name well known even in this country—who has also corrected several errors of naming in the unfinished work of Graf. The descriptions are taken mainly from Neilreich's Flora of Lower Austria, Hausmann's Flora of Tyrol, and Moritz's Flora of Switzerland. The present volume is illustrated by a view of Mont Blanc in the form of a frontispiece.

This volume is intended to be followed shortly by others of a similar scope.

ALFRED W. BENNETT.

6, PARK VILLAGE EAST,
REGENT'S PARK, *August 1879*



INTRODUCTION.

WHAT do we understand by an Alpine Plant? The best answer to this question has been given by Professor Kerner, of Vienna, who defines Alpine Plants to be those "which have their dwelling-place especially above the limit of timber-trees, and retain there the same form; even though, under certain local conditions, they may descend below the limits of the Alpine region." With this definition all other botanists agree in the main. There are, however, a few species, with respect to whose claim to be included in the category opinions may differ; partly because the enormous area of the Alps has not yet been so completely investigated that it is known with certainty with respect to every species whether its principal distribution is above or below the tree-limit; partly, also, because in some species more importance should perhaps be attached to the most luxuriant development than to the occurrence of the greatest number of specimens.

In the present work—which lays no claim to a strict scientific purpose, but rather has in view the object of directing the attention of Alpine visitors to the beautiful children of Flora—it is necessary, in some cases, to include plants which, in the strict sense of the term, could scarcely be called Alpine.

We may cite as examples *Atragene alpina*, *Arnica montana*, *Cypripedium Calceolus*, *Narcissus poeticus*, etc., as plants of the lower Alps, which delight in bushy or moist situations, and therefore occur only rarely or in a few habitats in the region north of the Alps, but attract attention in the lower Alps from their great abundance, and in consequence have, to visitors to the Alps, the aspect of Alpine plants, although they only rarely pass the tree-limit.

Especially is this the case with the Lady's Slipper, *Cypripedium Calceolus*, which, elsewhere so rare, is very abundant in the calcareous Alps, and very striking from its remarkable flowers; and with the beautiful Narcissi which in June clothe in thousands the moist meadows of the lower Alps of Lower Austria, and the Salkzammergut,

and fill the air with their fragrance. These plants, and others of a similar nature, must not be omitted in a work intended not only for those who climb the highest Alpine peaks, but also for those who seek recreation in the enjoyment of nature in the lovely mountain valleys.

And if we ask the further question: "What is the origin of Alpine plants?" our answer must not be merely: "They have come there and are there." We have at least been furnished by some investigators with sufficient material to come nearer to a solution of the question, which only a short time since was regarded as an unsolved riddle:—"Where is the native home of a plant?" in other words, "What is its history, setting out from a local starting-point, and tracing its changes through the influence of physical laws in the course of ages, and of geological events, until its occupancy of its present area?" The great high-roads of the migrations of plants on water and on land have already been assiduously studied, as well as the border-paths and by-ways; and by following out these roads, the home has been ascertained with some degree of certainty of a large number of species, although not in truth the native home of an entire flora, since almost every species has its own circle of distribution, the bounds of which very rarely coincide with those of any other. Thus almost every species has its own starting-point, its own home, its own history.

Dr. Christ reckons the total number of Alpine species of plants at 693; of which 589 occur in the Eastern, 531 in the Western, and 395 in the Central Alps. Only 128 species are peculiar to the Eastern, 86 to the Western 75 to the Eastern and Western, excluding the Central while not more than 6 species occur in the Central, but are absent from both the Eastern and Western Alps.

Until quite recent times, it was usual to regard the Alpine as derived from the Arctic flora; and that small peninsula of northern Asia, known as Lesser Scandinavia, was singularly looked on as the point of departure of a north-alpine flora as well as fauna. A large array of facts has now, however, proved with considerable certainty the correctness of the recent hypothesis of Professor Rutimeyer, that Northern Scandinavia cannot rightly be regarded in the light of a centre of creation; while, with equal skill, was it previously shown by Dr. Christ, by means of statistical tables, that temperate northern

Asia, rather than Scandinavia, is the original homestead of the Arctic flora, the Alps themselves being for the most part the home of Alpine plants. Among the 693 species of the Alpine flora, there are only 271 which are found also in the north of the old and new worlds; of these 182 belong also to temperate northern Asia; and 422 species must be considered as purely Alpine, their distribution being very limited as compared to that of the northern Asiatic vegetation. We may indicate, as the bounds of the purely Alpine vegetation, to the north the German range of mountains, to the south the peninsulas which run out into the Mediterranean; while the Caucasus is the most remote district which exhibits in its flora any Alpine character; and only weak outrunners reach as far as Scandinavia, the Ural Mountains, Greenland and Labrador in the north, and the Taurus and Persia in the east. The flora of the Carpathians and Pyrenees is, on the other hand, very nearly related to the Alpine, and must be regarded as belonging to it; the former including 580, the latter 339 Alpine species.

With regard to any foreign influences which have been brought to bear upon the Alpine flora, it is certain that these are more perceptible from the southern or Mediterranean flora, or from the east, than from any presumable Scandinavian native land; and that even the valleys at the foot of the mountains have sent their green and blossoming hosts upwards, which have settled there, and now thrive bravely.

These latter plants, removed from their warm original home, but nevertheless thriving well in colder situations, furnish interesting examples of the change in organisms caused by external influences. Thus, for example, the pale marsh forget-me-not, *Myosotis palustris*, of the plains, occurs far above the tree-limit, but there displays the most splendid azure-blue. This change suggests the hypothesis that the conditions of vegetation on the Alps have called forth, or at least have induced, the more powerful development of those splendid colours which delight us in so many Alpine plants; although it is by no means always the case that Alpine species have strikingly larger flowers, or more beautifully coloured, than the allied species of the plains. Thus the dwarf hare-bell of the Alps, *Campanula pusilla*, has smaller and much paler flowers than those of the common hare-bell of the lowland meadows, *Campanula rotundifolia*, from which it

appears to be derived ; many botanists regarding the former as merely a variety of the latter.

These few words may suffice to attract still further attention to this immense field for observation, where every excursion may become a journey of discovery, since so much has still to be done even in the statistics of vegetation.

It does not become me in this place to commend the work of the artist Seboth, who has undertaken the execution of the illustrations ; this must be left to the figures themselves. I think it, however, my duty to offer my best thanks to Herr Petrasch, the head gardener of the botanical garden at Graz, to whose exertions I am indebted for a constant supply of plants from all parts of our Alps, so that the drawings could always be made from fresh living specimens.

And thus I commit this little book to all lovers of nature and to all visitors to the Alps.

FERDINAND GRAF.

Graz, November, 1876.

ALPINE PLANTS.

THE NATIVE HOME OF ALPINE PLANTS.

Alpine plants have hitherto attracted the attention mainly of those tourists who are possessed of a love of nature; and their beauty has in consequence been admired only in their native habitats; but seldom have they been cultivated in gardens; although they are undoubtedly inferior to none of our garden favourites, either in respect to their habit, or to the various and beautiful colour of their blossoms. And yet the trouble and labour required for their culture is more remunerative than in the case of many fashionable flowers.

Any one at all familiar with the conditions of vegetable life, who observes Alpine plants in their native home, the higher mountains, and pays attention to the phenomena of nature, will at once become aware that the habitat of these plants, and the soil from which they derive their nourishment, vary greatly. The cause of this variation is to be traced in the special nature of the species, which not unfrequently displays a degree of obstinacy in the choice of soil.

Thus in moist shady spots on the mountain slopes, we find *Soldanella alpina*, *Saxifraga rotundifolia*, *S. stellaris*, and *Cortusa Matthioli*; in grassy Alpine meadows and pastures, many beautiful species of *Pedicularis* and *Ranunculus*; some cover the naked rock with a dense mass of blossoms, as *Globularia cordifolia*, *Azalea procumbens*, and *Dryas octopetala*; others occur in the crevices and hollows of stones, like *Draba aizoides*; bare mounds and heaps of stones are selected by others as their habitat. In contrast to many species which only pass to a small extent the region of *Pinus Mughus*, others, like *Braya alpina*, *Ranunculus glacialis*, etc., are found in the frigid neighbourhood of snow-fields and glaciers.

But, in addition to the situation, the soil in which Alpine plants grow also varies greatly. The majority are not particularly choice,

but are found everywhere, both on calcareous soil and on the primitive rocks. But some, and indeed a good number of species, are confined to particular kinds of rock, argillaceous or sandstone; some occur in great masses only on the calcareous Alps, like *Rhododendron hirsutum*, others only on the primitive rocks, like *R. ferrugineum*.

Since climate exercises an important influence on the growth of Alpine plants, an acquaintance with this point, as well as with their native habitat, is of value.

The prolonged winter of the Alps is followed by a very short summer. The long days of this season, the warm bright sunshine, the fall of rain and dew, and the pure air, on the one hand; the night frosts and violent winds, on the other hand, induce peculiar climatic conditions, from which the habit of Alpine plants—for whose complete development, blossoming, and ripening of the seeds, only the short space of at most four months is allowed—acquires certain characteristics by which we readily distinguish them from the species of the lowlands. This difference is at once recognised by any one who has had the opportunity of observing Alpine plants in their native home.

The shrubs are mostly creeping and rooting, and prostrate on the rocks, as may be seen in the numerous Alpine willows, the beautiful blue *Globularia cordifolia*, *Azalea procumbens*, etc. Other perennial species form dense cushions covered with hundreds of blossoms, as *Silene Pumilio*, *Cherleria sedoides*, the beautiful *Androsaces*, *Saxifragas*, etc. Most species appear almost stemless, or very crowded with a short flower-stem, but comparatively large flowers, which are in no way inferior to those of our exotic favourites in the purity and beauty of their colours. It is needful only to mention the well-known blue *Gentianas*, *Ranunculi*, *Primulas*, etc., which astonish and enchant the unscientific as well as the botanist.

THE CULTIVATION OF ALPINE PLANTS.

When Alpine plants are cultivated in gardens for enjoyment or for purposes of study, it is difficult to attain a good result unless special attention is directed to replacing those conditions of growth of which they have been deprived in their new situation. Although a considerable number can then be cultivated with good result, there

are some species which have up to the present time resisted every effort to transfer them to the lowlands, and which, in spite of every care, die off in the first or second year.

Since most Alpine plants delight in much light and sunshine, and, if grown in the shade, either never flower, or become drawn and altogether lose their proper habit, and thus degenerate, the attention must first of all be directed to choosing for them an open situation when planted in the open border; the shade of trees or of a wall is desirable only as a protection from the noon-day sun; and these should be at such a distance as to present at other times no impediment to their natural habit.

This habit is best and most advantageously preserved when the young plants are planted on rocks, which are grouped so as to represent a mountain in miniature; the subsoil should consist of sand, broken pottery, or other material which allows the moisture to drain through readily; and before the building of the rockery is commenced, care must be taken that the foundation of the whole is made to assume that form which the entire group will possess when complete. A commencement is then made by laying on this foundation the stones, which should be of various forms and sizes, the chief point to be kept in view being to avoid any artificial arrangement, so that the structure may have an altogether natural aspect. The stones should be so placed that smaller or larger cavities are left between them, which are afterwards filled up with a suitable soil, so as to form, as it were, little beds which will be ready for the reception of the desired plants.

In case a number of such rockeries are being constructed, it is desirable to take into account the particular species which are to be planted on each, so that each rockery shall be built only of stones of a particular kind of rock, calcareous for those which prefer chalk or limestone, granite, gneiss, or slate, for those of the primitive rocks etc., in order that it may not be necessary afterwards to construct a suitable bed for each separate species.

When the building is finished, in other words, the habitat created, the next work is to fill up the little beds with the proper soil. For calcareous plants, lime-rubbish, mortar, or small pieces of limestone are mixed with heath-soil; for those which inhabit the primitive rocks, a wood-soil free from lime, mixed with quartz-sand or

charcoal. As there are some species which require for their culture argillaceous or sandy soil, this must also be provided in their case.

If we already have young plants ready in pots, and wish to place these in their permanent situation, this may be done either in the spring, from March to April, or in autumn, from August to September, to allow time for the plants to get thoroughly well rooted before the winter.

Although, under certain circumstances, it is desirable to arrange the plants according to species, it is preferable, especially in small collections, to fix their arrangement and distribution in accordance with their size. In planting the specimens, it should also be seen that those species which prefer the shade be placed on the north side of the rockery, so as to be protected from the sun, and that the remainder be distributed in such a way that *cæspitose* and creeping plants, such as *Saxifraga hypnoides*, *Gypsophila repens*, *Arabis alpina*, etc., which have a tendency to spread, are placed in the lower and larger beds; those which need more sun and grow naturally on rocks, like most species of *Sempervivum*, *Saxifraga*, *Potentilla*, and *Papaver*, in the interstices of the upper portion; and the larger and more shrubby plants, like the species of *Rhododendron*, *Pinus Pumilio*, *Daphne alpina*, *Betula nana*, *Helleborus niger*, *Trollius europæus*, etc. are so distributed over the whole structure that each group may have a pleasing and natural appearance.

When the planting is completed, the soil in the interstices should be covered with small pieces of stone, to prevent it from being scorched, and also to hinder the growth of weeds. The whole has then to be watered, and then left to itself until the plants are well rooted.

The subsequent treatment of Alpine plants involves but very little trouble, and does not present any difficulty. If the planting has been done in spring, they should on sunny days be sprinkled with the rose both in the early morning and in the evening. But in summer, when the weather is very hot, it is necessary to sprinkle them with the watering-can several times in the day, and the earth around them must also be kept constantly moist, in order to temper the dry air, and to provide the Alpine plants with a supply of the dew which is so necessary for them. The weeds which spring up must be removed, and the beds always kept clean; on the shady side especially,

hurtful lichens, *Marchantia*, and *Lunularia* are liable to make their appearance; these must be at once removed, since, when they have once established themselves, they can only be got rid of with difficulty, and are likely to injure and even to kill the weaker plants.

In order to get rid of the slugs, which often seek out Alpine plants, and are very destructive to them, lettuce leaves or slices of apple may be placed at particular spots, on which they will collect, and may be destroyed. Late in the autumn, when the first frosts come, those species, the parts of which above ground die down after flowering and ripening their seeds, and which are perpetuated by rhizomes or root-stocks, should be covered with a thin layer of moss; but those with caespitose stems, which do not die down in the winter, with a brushwood of pine branches to protect them from the injurious consequences of too rapid changes of temperature. Since we have not in this climate the thick covering of snow which, in the higher mountains, remains without interruption till late in the spring, this must be replaced by an artificial protection. Should a fall of snow take place in the winter, it should be swept together and heaped up over the rockeries and between the paths, so that the vegetation may be kept back and prevented from making progress as long as possible in the spring.

In the spring when the damp, mild weather sets in, the brushwood should be at first lifted up a little, and finally altogether taken away when the fine weather becomes settled.

The plants should now be carefully stripped of all dead or decaying parts, the soil somewhat loosened, and the beds filled up as much as is necessary, the weak or sickly plants attended to, and, as soon as warm spring weather has set in, the whole erection watered daily.

Many Alpine plants will remain for several years in the same spot, and thrive better when not disturbed. This is the case with all shrubby species, and with those whose roots penetrate very deep into the soil, as for example the species of *Astragalus*, *Oxytropis*, *Astrantia*, etc.; others, on the contrary, must be transplanted every year. In some species, the older portions of the rhizome die off, in consequence of their continued growth, as may be seen in *Wulfenia carinthiaca*, *Armeria alpina*, and many species of *Valeriana* and *Primula*.

The decay of plants which grow vigorously or too thickly may

be prevented by scattering broken stones, or even sand among the tufts. In order to grow *Silene acaulis* or *Rhododendron chamæcistus* successfully, small pieces of lime or mortar must be scattered among the stems.

POT-CULTURE OF ALPINE PLANTS.

Most Alpine plants can be grown very well in pots, if care is taken to choose those kinds which have not a creeping habit and are not too large. The more tender and delicate kinds are indeed better grown in pots, since they can thus be better protected than in the open ground at any time of the year from any hurtful temperature, by changing their place, or by covering or shading them.

In the spring the pots should be placed in a suitable spot in the open ground, where possible in a bed facing east and west; they should be set on sand or gravel, and sunk in the ground up to the rim when the summer-temperature becomes high. In the middle of the day they should be shaded, in the morning and evening watered as they require it, or sprinkled with the rose more often during the day.

The pots should be left out through the summer; but from time to time they should be taken up, cleaned, and filled up with soil. During continuous rain they should be covered with lathes or boards, since an excess of moisture is very injurious to the plants.

In districts where the winter is very severe, only the more hardy species can be left in the same spot through the winter; and these must be protected with brushwood on the commencement of the cold weather, and, after the snow has fallen, covered with boards. It is much better, especially for the more delicate kinds, to place them for the winter in a glass frame or a walled-in bed, where they can be protected from too severe cold, and allowed air when the weather is milder. They should in winter only be watered sufficiently to keep the soil always moderately moist.

When growth commences in spring, the plants should be taken out of the frames, any dead parts cleared away, and again placed in the open. The best time for transplanting Alpine plants is the beginning of April, when growth has just commenced.

The most suitable soil for most kinds is a sandy heath-soil. The large vigorous species, and those which grow rapidly, should be

placed in unsifted heath-soil, with some mixture of loam and sand ; the weaker and more delicate kinds in sifted heath-soil, mixed with pure quartz-sand and charcoal ; in the case of calcareous plants, some lime-rubbish or mortar must be added. Pots of too large a size should not be used ; they should be chosen in reference to the size of the plant, and especially of its roots. When transplanting, clean pots only should be taken, and furnished with a drainage of potsherds or small stones. A portion of the old soil should be taken away without injuring the roots, and the plants not set too deep. They must then be well watered with a rose, so as thoroughly to saturate the soil. The best water to employ is rain-water, or, when there is none of this, river or standing pond-water. When treated in this way the plants will grow freely, retain their dwarf habit, and blossom regularly.

If the specimens have been brought fresh from the mountains, Alpine plants, like all others, require special treatment. They must be placed in suitable pots, and planted in a soil mixed with lime, sand, or leaves, according to the species, watered moderately, placed in a shady spot, and sprinkled several times a day in fine warm weather. When they have once taken root, they can be transplanted into the open ground, or still grown in pots.

CULTIVATION OF ALPINE PLANTS IN A ROOM.

Although Alpine plants are, as a rule, not adapted for window culture, there are many that can be kept through the winter, if well chosen, and if care is taken with them.

Species adapted for this culture should be placed, late in the autumn, between the windows of a light unwarmed chamber, or in a glass frame so arranged beneath a window that there is some space between the pots, which is to be filled up with moss.

During mild weather, the windows should be kept constantly open, and closed only on cold stormy days. It is not injurious for the temperature of the air in the frame to fall below the freezing point. The plants should be watered only very sparingly, and always with standing water.

When the temperature rises in March, the plants must have a greater quantity of water given them, and be exposed to the air as much as possible ; in the evening they may be sprinkled with a fine

rose. In the early summer, it is desirable, if the plants are not to be placed in the open border, that the window be replaced by a suitable sunshade, made of linen stretched on a frame, or which may even be made of reeds. Since a number of Alpine plants blossom about this time, they must be protected in the day from the noon-day heat of the sun.

In the summer months, the plants may be kept somewhat moister, and may be daily sprinkled with a rose in the early morning and in the evening. In the autumn, the pots should be cleaned, the soil loosened, and the firmly rooted plants again treated in the same way as in the previous winter.

The following species are especially adapted for window culture :—

<i>Achillea Clavenae</i>	<i>Primula Auricula</i>
<i>Anemone Halleri</i>	„ <i>marginata</i>
„ <i>vernalis</i>	<i>Saxifraga Aizoon</i>
<i>Arenaria ciliata</i>	„ <i>caesia</i>
<i>Artemisia Mutellina</i>	„ <i>elatior</i>
<i>Cerastium lanatum</i>	„ <i>pyramidalis</i>
<i>Corthusa Matthioli</i>	„ <i>rotundifolia</i>
<i>Cyclamen europaeum</i>	„ <i>tenella</i>
<i>Daphne Blagayana</i>	<i>Semprevivum</i> , any species
<i>Draba aizoides</i>	<i>Silene alpestris</i>
„ <i>tomentosa</i>	„ <i>Saxifraga</i>
<i>Geranium argenteum</i>	<i>Thlaspi alpinum</i>
<i>Helianthemum oelandicum</i>	<i>Tunica Saxifraga</i>
<i>Mœhringia Ponaë</i>	<i>Veronica saxatilis</i>

PROPAGATION OF ALPINE PLANTS.

Alpine plants may be propagated either (1) by division of the rhizome; (2) by cuttings; or (3) by seed.

1. Most Alpine plants may be increased by dividing the rhizome, or root-stock, when they are transplanted, either in the spring before shooting out, or in the autumn after growth is completed, into as many parts as it has buds. Many kinds which put out runners can also be increased simply by detaching separate pieces. In the

case of the more hardy species, the detached pieces are placed in the beds prepared for them; those of more delicate kinds in suitable pots, well watered, and at first shaded. After taking firm root they are treated like the parent plant.

2. To propagate by cuttings, half-ripe branches should be cut off short in July, and placed in a shallow pan. The soil for the cuttings should be made porous by a mixture of white sand and charcoal, in order that the roots may penetrate more easily. They must then be placed in a glass frame, or in a shady place, and covered with bell-glasses, kept of a uniform moisture, and daily allowed fresh air.

As soon as the cuttings have grown to some size, and become firmly rooted, they should be gradually accustomed to the air until they are ready to be transplanted. They should then be planted in small pots, shaded until they have become quite hardened, and then treated like the parent plants.

The following species are easily grown from cuttings:—*Artemisia Mutellina*, *Aretostaphylos officinalis*, *Cerastium lanatum*, *Daphne Blagayana*, *Juniperus nana*, *Linnea borealis*, *Rhamnus alpina*, *Silene Pumilio*, etc., etc.

3. Biennial and perennial Alpine plants can be grown from seed, both in the open border and in pots. Only, however, in the case of a few biennial plants with long tap-roots which will not endure transplantation, must they be sown on the spot which they are intended to occupy when in flower. The seeds of perennial Alpine plants are better sown in well-drained pots filled with a sifted sandy heath-soil.

The seeds should be sown very thinly in May or June, and only covered so deeply with soil as the size of the seed requires. Very small seeds may be lightly covered only with triturated moss; the pots should then be watered with a very fine rose, placed in a frame or manure-bed, well shaded, and kept of a uniform moisture. As soon as the seedlings make their appearance, they should be gradually hardened and exposed to the air.

When the young plants have attained a good size, they may, in the autumn, be planted in the open border, or be transplanted singly, or a few together, into small pots. They may then be placed in a frame below the window, and should at first be kept somewhat

shaded, and moderately moist. During the winter they must be more freely exposed to the air, and kept clean and dry. In the spring, as soon as the weather permits, they may be put in the open border, and treated like old plants.

In conclusion, we give a list of the most beautiful Alpine plants adapted for cultivation. The following letters indicate the kind of soil which the plants require under cultivation :—

c—calcareous soil ; *l*—loam ; *s*—sandy soil ; *f*—free from lime (plants of the primitive rocks) ; *in*—growing indifferently in any soil.

Achillea Clavenae, <i>c. l.</i>	Anemone narcissiflora, <i>c. l.</i>
„ nana, <i>f. s.</i>	„ vernalis, <i>c. l.</i>
Aconitum Anthora, <i>in.</i>	Aquilegia Bauhini, <i>c. s.</i>
„ Napellus, <i>in.</i>	Arabis alpina, <i>in.</i>
„ variegatum, <i>in.</i>	„ bellidifolia, <i>in.</i>
Acrostichum Marantae, <i>s.</i>	„ ciliata, <i>in.</i>
Adenostyles albifrons, <i>in.</i>	„ coerulea, <i>in. l.</i>
„ alpina, <i>in.</i>	„ pumila, <i>c. s.</i>
Agrostis rupestris, <i>s.</i>	„ vochinensis, <i>in.</i>
Ajuga pyramidalis, <i>f. l.</i>	Arctostaphylos officinalis, <i>l.</i>
Alchemilla alpina, <i>in.</i>	Armeria alpina, <i>in.</i>
„ fissa, <i>f. s.</i>	Arnica montana, <i>in. l.</i>
„ pentaphylla, <i>f. s.</i>	Artemisia Mutellina, <i>f. l.</i>
„ pubescens, <i>in.</i>	Aster alpinus, <i>in.</i>
Allosorus crispus, <i>f.</i>	Astragalus purpureus, <i>c.</i>
Alnus viridis, <i>in.</i>	Astrantia carniolica, <i>in. s.</i>
Alsine austriaca, <i>c.</i>	„ major, <i>in.</i>
„ laricifolia, <i>in.</i>	Athamanta cretensis, <i>c. s.</i>
„ Gerardi, <i>s.</i>	Atragene alpina, <i>in.</i>
Alyssum Wulfenianum, <i>c. s.</i>	Avena alpestris, <i>c. s.</i>
Androsace Chamaejasme, <i>c.</i>	Azalea procumbens, <i>f.</i>
„ lactea, <i>c. s.</i>	Bellidiastrum Michellii, <i>c. s.</i>
„ obtusifolia, <i>c. l.</i>	Betonica Alopecurus, <i>in.</i>
„ villosa, <i>c. s.</i>	Bupleurum graminifolium, <i>in.</i>
Anemone alpina, <i>c. l.</i>	Calamintha alpina, <i>in.</i>
„ baldensis, <i>c. s.</i>	„ barbata, <i>f.</i>
„ Halleri, <i>c. s.</i>	„ pulla, <i>c.</i>

Calamintha rotundifolia, in.
 „ *thyrsoides, in.*
Cardamine alpina, f. s.
 „ *resedifolia, f. s.*
Carex atrata, in.
 „ *baldensis, c. s.*
Centaurea alpina, c.
Cerastium alpinum, in.
 „ *lanatum, in. s.*
 „ *latifolium, in.*
Cineraria aurantiaca, l.
Cirsium acaule, l.
 „ *spinosissimum, in.*
Coeloglossum viride, c. s.
Convallaria verticillata, in.
Crocus vernus, in.
Cypripedium Calceolus c. s.
Cytisus alpinus, in.
Daphne alpina, c. s.
 „ *Blagayana, l.*
 „ *striata, c. s.*
Delphinium elatum, in.
Dianthus alpinus, c.
 „ *glacialis, f.*
Doronicum austriacum, in. l.
Draba aizoides, c. s.
 „ *ciliata, in.*
 „ *Joannis, c.*
 „ *stellata, c.*
 „ *tomentosa, c. s.*
 „ *Zahlbruckneri, f.*
Dryas octopetala, c.
Epilobium alpinum, s.
Epimedium alpinum, in.
Erica carnea, in.
Erigeron alpinus, in.
Erinus alpinus, in.
Eriophorum alpinum, f.

Eryngium alpinum, l.
Festuca alpina, in. s.
 „ *pumila, c. s.*
Gentiana acaulis, c. l.
 „ *asclepiadea, l.*
 „ *bavarica, in. s.*
 „ *verna, in.*
Geranium argenteum, c.
 „ *macrorrhizum, in.*
Geum montanum, l.
Globularia cordifolia, c. s.
 „ *nudicaulis, c. l.*
Gnaphalium Leontopodium, in. s.
Gymnadenia albida, c. s.
 „ *conopsea, in.*
Gypsophila repens, s.
Hedysarum obscurum, c.
Helleborus niger, l.
Hieracium albidum, f. s.
 „ *alpinum, f. l.*
 „ *aurantiacum, in.*
 „ *staticifolium, in.*
 „ *villosum, c. s.*
Homogyne alpina, l.
 „ *discolor, l.*
 „ *sylvestris, l.*
Horminum pyrenaicum, c.
Hutchinsia alpina, c. s.
Kerneria saxatilis, in.
Leontodon pyrenaicum, in.
Linaria alpina, in. s.
Linnaea borealis, f. s.
Linum alpinum, c.
Lonicera alpigena, c.
Lychnis alpina, s.
Meum athamanticum, c.
 „ *Mutellina, in.*
Moehringia muscosa, c.

Moehringia Ponae, c. s.
Mulgedium alpinum, in.
Myosotis alpestris, in.
Narcissus poëticus, in.
Nigritella angustifolia, in. s.
Orchis globosa, c. s.
 ,, *incarnata, s.*
 ,, *maculata, s.*
 ,, *sambucina, s.*
Orobis luteus, c. s.
Oxyria digyna, f.
Oxytropis campestris, f. l.
 ,, *montana, c. l.*
Papaver alpinum, c.
Paradisica Liliastrum, s.
Petrocallis pyrenaica, c. s.
Phaca frigida, in. s.
Phleum alpinum, in.
Phyteuma comosum, c. s.
 ,, *hemisphaericum, f.*
 ,, *Michellii, in. l.*
 ,, *pauciflorum, f. l.*
 ,, *Scheuchzeri, c. l.*
Pinguicula alpina, l.
 ,, *vulgaris, l.*
Pinus Cembra, f.
 ,, *Mughus, in.*
Polygala Chamaebuxus, in.
 var. *purpurea, in.*
Polygonum viviparum, in.
Potentilla aurea, in.
 ,, *caulescens, c. s.*
 ,, *Clusiana, c. s.*
 ,, *frigida, f. l.*
 ,, *grandiflora, f. l.*
 ,, *multifida, in.*
 ,, *nitida, f. l.*
 ,, *nivea, f. l.*

Primula Auricula, c.
 ,, *calycina, l.*
 ,, *commutata, l.*
 ,, *farinosa, c. l.*
 ,, *integrifolia, c. s.*
 ,, *longiflora, in.*
 ,, *minima, l.*
 ,, *pubescens, c. l.*
 ,, *spectabilis, in. l.*
 ,, *villosa, f. l.*
Ranunculus aconitifolius, in.
 ,, *alpestris, c. s.*
 ,, *glacialis, f. s.*
 ,, *hybridus, c.*
 ,, *parnassifolius, in. l.*
 ,, *rutaefolius, f. l.*
 ,, *Thora, c. s.*
 ,, *Trautfellneri, c. l.*
Rhododendron Chamaecistus, c.
 ,, *ferrugineum, f.*
 ,, *hirsutum, c.*
Rosa alpina, in.
Salix Arbuscula, c.
 ,, *herbacea, in.*
 ,, *Myrsinites, f.*
 ,, *reticulata, in.*
 ,, *retusa, in.*
Saxifraga aizoides, in.
 ,, *Aizoon, c.*
 ,, *biflora, f. s.*
 ,, *bryoides, f. s.*
 ,, *Burseriana, in.*
 ,, *caesia, c. s.*
 ,, *caespitosa, in.*
 ,, *crustata, c.*
 ,, *cuneifolia, in.*
 ,, *elatior, c.*
 ,, *hypnoides, in.*

Saxifraga muscoides, *in*.

- „ *mutata*, *c. l.*
- „ *oppositifolia*, *f. l.*
- „ *rotundifolia*, *in*.
- „ *sedoides*, *in*.
- „ *Seguieri*, *s.*
- „ *squarrosa*, *c. s.*
- „ *stellaris*, *in*.
- „ *tenella*, *in. s.*

Scabiosa lucida, *in*.

Sempervivum arachnoideum, *f. s.*

- „ *Funkii*, *in*.
- „ *hirtum*, *in*.
- „ *montanum*, *in*.
- „ *Pittonii*, *in*.
- „ *tectorum*, *in*.
- „ *tomentosum*, *in. s.*
- „ *Wulfenii f. in*.

Senecio abrotanifolius, *in. s.*

- „ *incanus*, *in*.

Silene acaulis, *in. s.*

- „ *alpestris*, *c. s.*
- „ *Pumilio*, *f.*
- „ *quadrifida*, *in. s.*

Silene Saxifraga, *in*.

Soldanella alpina, *in. l.*

- „ *minima*, *l.*
- „ *pusilla*, *l.*

Thalictrum alpinum, *f.*

- „ *aquilegeefolium*, *in*.
- „ *foetidum*, *in*.

Thlaspi alpinum, *c. s.*

- „ *rotundifolium*, *c.*

Trifolium badium, *f.*

Trollius europaeus, *in*.

Valeriana celtica, *in. l.*

- „ *montana*, *in. s.*
- „ *saxatilis*, *c. s.*
- „ *supina*, *s.*
- „ *tripteris*, *in*.

Veronica alpina, *in*.

- „ *bellidifolia*, *f. s.*
- „ *saxatilis*, *c. s.*

Viola alpina, *c. s.*

- „ *biflora*, *in*.
- „ *lutea*, *f. in*.

Wulfenia carinthiaca. *l.*

Zahlbrucknera paradoxa f. s.

DESCRIPTION OF PLATES.

ATRAGENE ALPINA L. ALPINE ATRAGENE.

RANUNCULACEÆ.

Plate 1.

Shrubby. Stem branched, woody, spreading, decumbent or climbing, swollen at the joints, scaly, leafy, and provided with 3-branched dry tendrils (the dead leaf-stalks of the previous year). Leaves opposite, stalked, usually doubly ternate, and, as well as the leaves and leaf-stalks, hairy; segments ovate or lanceolate, acuminate, unequally serrate, often lobed, or connate at the base. Flowers solitary, on long stalks, axillary, dependent. Petals erect, spathulate, Sepals lanceolate, erect or patent. Seed-vessels terminating in a long beard.

Flowers violet. Stony places in the Alps and lower Alps, also in woody subalpine districts, often covering hedges, trees, and shrubs with the most beautiful garlands. June—August.

ANEMONE HALLERI ALL. HALLER'S ANEMONE.

RANUNCULACEÆ.

Plate 2.

Villous with white shining glandular hairs. Leaves pinnate; pinnae in 2—3 pairs, pinnatifid; the lobes 2—3-cleft; ultimate segments entire or 3-cleft. Flowers erect; sepals villous.

Flowers usually lilac, rarely white or rose-coloured. Subalpine margins of woods, on the higher Alps of Switzerland and Piedmont. March—April; on the Alps, July.

Distribution.—Siebenburgen; Carpathians; Eastern and Western Alps; Central France.

ANEMONE NARCISSIFLORA L. NARCISSUS-FLOWERED ANEMONE.

RANUNCULACEÆ.

Plate 3.

Root-stock oblique, premorse, with branching fibres. Stem erect, simple, with several leaves at the base, like the leaf and flower-stalks villous, and bearing a terminal 3—6-flowered umbel, less often 1-flowered by abortion. Root-leaves stalked, palmate, 3—5-partite, sparsely villous or glabrous on the upper side; the segments usually doubly 3-cleft. Bracts 3—4, sessile, more or less resembling the root-leaves, smaller, less divided, often only 2—3-cleft. Sepals usually 5, glabrous on both sides. Seed-vessel erect; carpels not bearded, very shortly beaked.

Stem 3 in. to 1 ft. high; flowers white or rose-coloured, $\frac{3}{4}$ in. — $1\frac{1}{2}$ in. in diameter. Rocky places and pastures in the calcareous Alps and lower Alps, 3000—6000 ft.; often covering large tracts. End of May—August.

Distribution.—Erzgebirge; Eastern, Central, and Western Alps; Vosges; Jura.

ANEMONE ALPINA L. ALPINE ANEMONE.

RANUNCULACEÆ.

Plate 4.

Root-leaves ternately decompose; segments deeply cut. Bracts ternate, shortly stalked, resembling the root-leaves. Flowers solitary. Sepals usually 6. Carpels, as well as the very long beard, villous.

Stems 3 in.—1 ft. high; flowers white, very variable in size, or yellow (*A. sulphurea* L.); blossoming before the leaves are fully developed. Stony and rocky places in the Alps and lower Alps. May—July, remaining till August in the higher Alps.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Vosges; Jura.

RANUNCULUS TRAUNFELLNERI HOPPE.
TRAUNFELLNER'S BUTTERCUP.

RANUNCULACEÆ.

Plate 5.

Leaves veined; root-leaves 3-partite, reniform in outline; the central lobe 3-cleft, the lateral ones deeply 2-cleft; laciniae again 2-cleft; the divisions lanceolate. Stem 1-flowered, usually with one leaf; the stem-leaf linear, undivided. Flower-stalk furrowed. Calyx glabrous. Petals obcordate or 3-lobed.

Stem 1—3 in. high; leaves not shining; flowers white. June—Autumn.

Distribution.—Eastern, Central, and Western Alps.

RANUNCULUS PYRENÆUS L. PYRENEAN
BUTTERCUP.

RANUNCULACEÆ.

Plate 6.

Leaves veined, linear-lanceolate, entire. Stem 1—3-flowered; flower-stalk woolly at the top. Carpels obovate, convex, smooth, without any ridge; beak slender, hooked. Root-fibres cylindrical, narrowing towards the apex.

Flowers white. Very high Alpine meadows. June—July.

Distribution.—Eastern, Central, and Western Alps.



RANUNCULUS MONTANUS L. MOUNTAIN BUTTERCUP.

RANUNCULACEÆ.

Plate 7.

Root leaves palmate; divisions obovate, 3-cleft, obtusely toothed; lowermost stem-leaf 5-cleft; divisions linear, palmately diverging; upper stem-leaf 3-cleft. Stem 1—many flowered; flower-stalk round. Carpels margined, convex on both sides; beak somewhat curved, many times shorter than the carpel. Receptacle bristly.

Flower yellow. Alpine and subalpine pastures. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Jura.

TROLLIUS EUROPÆUS L. EUROPEAN GLOBE- FLOWER.

RANUNCULACEÆ.

Plate 8.

Root tufted, with bushy fibres. Stem erect, simple, and 1-flowered; less often branched, 2—3-flowered, like the whole plant glabrous. Leaves palmately 5-cleft, the lower ones stalked, upper ones sessile; divisions rhomboidal, 3-cleft, unequally cut. Sepals almost closed into a ball. Capsule (or rather follicle) glabrous, linear, obliquely wrinkled.

Sepals citron-yellow; the very small stamen-like petals bright yellow. Damp subalpine and alpine meadows and mountain declivities, often in great masses, and a few even on the highest peaks. May—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Black Forest; Vosges; Jura. (British).

AGUILEGIA PYRENAICA KOCH. PYRENEAN
COLUMBINE.

RANUNCULACEÆ.

Plate 9.

Flowers about 1 inch broad; spur of corolla nearly straight at the apex, or curved, but not coiled up; receptacle rounded, as long as or longer than the stamens. Leaves once or twice ternate; leaflets obovate-spathulate, 2—3-lobed, with rounded entire or slightly indented lobes. Stem 6 in. to 1 foot high, tender, more or less covered with viscid glands.

Leaves glabrous; lobes ovate or obovate; stem downy and viscid only at its upper part, otherwise glabrous. Perennial. June—July. Rocky places in the lower Alps in Upper Bavaria, Tyrol, Salzburg, Carinthia, etc.

A variety with small blue or lilac flowers in rocky places in the Eastern Alps; June—July.

(*A. pyrenaica*, Koch, not DC.; *A. Einsleiana*, F. Schulz).

HELLEBORUS NIGER L. CHRISTMAS ROSE.

RANUNCULACEÆ.

Plate 10.

Root-stock, thick oblique, knobbed, with black fibres. Stem erect or ascending, simple, like the whole plant glabrous, usually 1-, rarely 2-flowered leafless, having in the upper part only 2 or 3 small elliptical or ovate bracts. Leaves radical, stalked, pedate, 7—9 cleft; divisions undivided or 2—3-cleft, linear-lanceolate, or wedge-shaped, acute, toothed. Flowers nodding. Sepals petaloid, elliptical. Capsule (or rather follicle) elongate, obliquely veined, with a long beak.

Stem 3—6 inches high. Calyx handsome, 2—3 inches in diameter, white or rose-tinted, ultimately green; petals and stamens yellow; leaves coriaceous, only springing up after the flowers, but remaining through the winter, so that when in blossom the leaves of the preceding year are often still in existence. The root-stock contains a narcotic poison of a very fatal character. It is officinal. Common in calcareous subalpine woods, as high as the zone of *Pinus Mughus*.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

**ACONITUM ANTHORA L. FINE-LEAVED
MONKSHOOD.**

RANUNCULACEÆ.

Plate 11.

Root-stock with 1—3 globular tubers covered with fibres. Stem erect, glabrous below, above, like the flower-stalks and calyx, downy. Leaves pedately or palmately 5—9-cleft, usually glabrous, except the root-leaves; divisions palmately multisect with narrowly linear segments. Flowers in a simple or branched terminal raceme. Calyx persistent after withering; hood hemispherical and helmet-shaped. Capsule (follicle) hispid or ultimately glabrous.

Flowers bright yellow. Stony places in the Alps. August—Sept.

Distribution.—Carpathians; Eastern and Western Alps; Jura.

**ACONITUM VARIEGATUM L. VAR. CAMMARUM.
VARIEGATED MONKSHOOD.**

RANUNCULACEÆ.

Plate 12.

Stem 1—5 feet high, rigid, leafless towards the base. Leaves stiff, bright green, not shining, shortly stalked, more broadly and coarsely divided than in *A. Napellus*. Raceme more leafy, rarely quite simple; then short and with but few flowers; usually branched, and then cylindrical or conical from the short branches; frequently paniculate from the branching of the lower branches. Sepals violet; often paler, or white or greenish towards the base, very rarely quite white. Hood handsome, 1—1½ inches, but very variable in size and height. In the same inflorescence are often flowers in which the two upper petals have straight and curved claws, and the hood is erect, oblique, or nearly horizontal.

Flowers violet, sometimes blue. Damp places by streams, etc., in mountain alpine and subalpine districts. June—September.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge.

(The plate is incorrectly lettered *Aconitum Napellus*.)

PAPAVER ALPINUM L. WHITE ALPINE POPPY.

PAPAVERACEÆ.

Plate 13.

Root tapering, putting up prostrate scaly aërial branches, loosely tufted. Stem erect, simple, leafless, 1-flowered, like the whole plant hispid. Leaves all radical, stalked, doubly pinnate; segments linear-lanceolate or wedge-shaped, entire. Stamens subulate. Capsule obovate, with stiff adpressed hairs. Petals white, yellow at the base, or olive-green.

Flowers white. Principally on calcareous debris on the Alps, and descending with this into the valleys and the beds of streams. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

(In the drawing the yellow base of the petals is not sufficiently represented).

ARABIS ALPINA L. ALPINE ARABIS.

CRUCIFERÆ.

Plate 14.

Root tapering, putting up branched decumbent aërial shoots and leafy stolons. Stem erect or ascending, simple or patently branched, covered like the leaves with forked hairs, not glaucous. Leaves coarsely toothed, frequently with a wavy margin, acute or obtuse, root-leaves wedge-shaped, gradually narrowed below; stem-leaves ovate or ovate-lanceolate. Seed-vessels not adpressed, patent in all directions. Seeds surrounded by a narrow membranous rim.

Stem 3 inches to 1 foot high; leaves a dirty green, pale; petals white, comparatively large, 3 lines long; pod (siliqua) 1—2 inches long, $\frac{3}{4}$ line broad.

Common by streams, margins of woods, or rocks, and in crevices in the subalpine zone, and as far as the region of *Pinus Mughus*; often descending lower in the beds of streams. May—Autumn.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

ARABIS PUMILA JACQ. DWARF ARABIS.**CRUCIFERÆ.***Plate 15.*

Root tapering, branched, with several crowns; root-crowns shorter or longer, often resembling stolons, tufted. Stem erect or ascending, simple, glabrous, or with fine hairs below, like the leaves not glaucous. Leaves entire or slightly toothed, acute or obtuse, with simple and forked hairs, or only ciliated and otherwise glabrous; root-leaves in a rosette, obovate or wedge-shaped, gradually narrowed below; stem-leaves linear or lanceolate, sessile, with narrow or rounded base. Petals obovate-lanceolate, patent. Seed-vessel erect, compressed. Seeds surrounded by a membranous ring half the width of the seed.

Leaves moderately thick, grass-green; flowers white. On rocks and stony places in the calcareous Alps, often descending to the subalpine region. June—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

THLASPI ROTUNDIFOLIUM GAUD. ROUND-LEAVED**THLASPI.****CRUCIFERÆ.***Plate 16.*

Root tapering, putting up elongated aerial branches, loosely tufted. Stem erect or ascending, simple, like the whole plant glabrous. Leaves blueish-green, entire, less often slightly toothed, acute or obtuse; root-leaves obovate, narrowed below, crowded; stem-leaves ovate, sessile, with a somewhat auriculate base. Seed-vessel narrowly wedge-shaped, nearly quadrangular, obtuse, very narrowly winged in front, 1—3-seeded.

Stems penetrating into crevices of rocks, often 2 feet long; leaves moderately thick; flowers lilac or peach-coloured. In fissures of rocks in the higher calcareous Alps (5500—6600 feet); not common. July—August.

Distribution.—Eastern, Central, and Western Alps.

HUTCHINSIA ALPINA R. BR. ALPINE HUTCHINSAI.**CRUCIFERÆ.***Plate 17.*

Leaves pinnate. Stem simple, naked. Raceme long and loose when in fruit. Petals twice as long as sepals. Seed-vessel elliptical, acute at both ends, terminating in a short style.

Flower white, comparatively large. In fissures of rocks and rocky places of the calcareous Alps; abundant. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

VIOLA LUTEA SMITH. YELLOW VIOLET.**VIOLACEÆ.***Plate 18.*

Perennial. Root with persistent filiform aerial shoots. Stem usually simple, ascending. Leaves crenate; the lower ones ovate-cordate or ovate-lanceolate; stipules palmately divided, ciliated, segments lanceolate, or the middle one broader. Spur scarcely longer than the auricles of the sepals.

Flower of various shades of yellow. Alpine and subalpine regions. May—June.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge. (British).



VIOLA ALPINA L. ALPINE VIOLET.

VIOLACEÆ.

Plate 19.

Root-stock cylindrical, knotted, oblique, branched above, not putting up any stolons. Leaves radical, stalked, ovate or cordate, crenate, acute, like the leaf- and flower-stalks glabrous or only slightly hairy, not increasing in size with age; stipules lanceolate, acute, entire or toothed, connate with the leaf-stalk to above the middle. Flower-stalk springing from the crown of the root, erect in fruit. Sepals acute or obtuse. Stigma hollow, cup-shaped. Capsule ovate, glabrous, nodding.

Leaves small, moderately thick, shining; flower-stalk 1—3 inches long; flower large, violet-azure, scentless. Rocky pastures in the calcareous Alps, in and above the region of *Pinus Mughus*.

Distribution.—Carpathians; Eastern Alps.

GYPSOPHILA REPENS L. CREEPING GYPSOPHILA.

CARYOPHYLLACEÆ.

Plate 20.

Root tapering, branched, putting up prostrate branched aëria shoots, tufted. Stem erect or ascending, simple or branched above, like the leaves glabrous. Leaves linear-lanceolate or linear, entire, acutel Flower in loose paniculate cymes. Calyx bell-shaped, 5-cleft; teeth lanceolate, membranous at the margin, 1-nerved, straight, obtuse with a short mucro. Petals more or less emarginate.

Stem 3—6 inches high; leaves moderately thick, blueish-green; petals 2—3 lines long, white or rose-tinted. Rocky and gravelly places in the calcareous Alps; often descending lower with boulders. July—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Jura.

(The petals are more often rose-coloured than white, as in the drawing).

DIANTHUS ALPINUS L. ALPINE PINK.**CARYOPHYLLACEÆ.***Plate 21.*

Root tapering, branched, tufted, putting up prostrate branched aerial roots. Stem erect or ascending, like the leaves glabrous, simple, 1-flowered, very rarely 2—3-flowered. Leaves linear-lanceolate, obtuse, smooth, or rough at the margin from minute indentations. Bracts 2—4, herbaceous, like the calyx-tube glabrous, subulate from an ovate-lanceolate base, as long as or shorter than the calyx-tube. Petals triangularly obovate-cordate, undivided, jagged at the apex.

Flowers flesh-coloured or purple above, with a ring at the base spotted with purple and white; below greenish white; stem 2—3 inches high. Alpine meadows. June—August.

Distribution.—Carpathians; Eastern and Central Alps.

SILENE ACAULIS L. STEMLESS CATCHFLY.**CARYOPHYLLACEÆ.***Plate 22.*

Stemless. Root woody, tapering, branched, putting up much-branched aerial shoots, entirely covered with the withered leaves, and bearing at the apex a rosette of fresh leaves, forming dense cushion-like tufts. Leaves radical, linear, acute or acuminate, entire, shortly ciliated, otherwise like the whole plant glabrous. Flowers dioecious or hermaphrodite, solitary at the extremities of the shoots, with longer or shorter stalks, often nearly sessile. Calyx cylindrical, 10-nerved, nerveless, glabrous, erect; teeth ovate, obtuse or emarginate. Petals obovate-lanceolate, with a shallow indentation; corona scale-like.

Tufts grass-green, often covering masses of rock; flowers rose-coloured, 4—6 lines in diameter. Rocks and pastures, common in the calcareous Alps, often descending to a low elevation. May—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps. (British).

SILENE RUPESTRIS L. ROCKY CATCHFLY.**CARYOPHYLLACEÆ.***Plate 23.*

Stem dichotomous, completely glabrous. Flowers terminal and in the forks. Calyx top-shaped, 10-cleft; teeth ovate, obtuse. Petals oobovate-cordate, with a corona. Leaves ovate, acute, sessile, the lower ones lanceolate, narrowed at the base.

Flowers milk-white or rose-coloured. Rocky alpine and sub-alpine situations. July—August.

Distribution. — Eastern, Western, and Central, Alps; Black Forest; Vosges.

MÆHRINGIA MUSCOSA L. MOSSY MÆHRINGIA.**CARYOPHYLLACEÆ.***Plate 24.*

Root tapering, branched, tufted, putting up branched fragile aerial shoots. Stem prostrate or ascending, branched, like the whole plant glabrous. Leaves narrowly linear or acicular, semi-cylindrical, acute, nerveless. Flowers in 1—3-flowered or forked loose cymes; flower-stalks elongated after flowering, and standing out horizontally. Calyx-teeth 4, ovate-lanceolate, acute, 1-nerved, with membranous margins. Petals 4, longer than the calyx. Stamens 8. Styles 2. Capsule 4-valved. Occasionally there are found a few flowers with 5-partite calyx, 5 petals, 10 stamens, 3 styles, and 6-valved capsule.

Stem fragile: flowers small, white. Occurs in large dense patches on damp rocks or walls, and in mossy shady places of the higher mountain-region, to a great elevation. May—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Jura.

(In the drawing the leaves are too broad, and the flowers too small).

PHACA FRIGIDA L. FRIGID PHACA.

LEGUMINOSÆ.

Plate 25.

Root-stock cylindrical, branched, creeping. Stem erect or ascending, simple, like the peduncle of the raceme nearly glabrous. Leaves pinnate; pinnæ in 4—5 pairs, oval or ovate, entire, obtuse, glabrous above, more or less hairy below and on the margin; stipules leaflike, ovate, semi-amplexicaul. Flowers pendent, in short compact axillary racemes. Legume elongated, inflated, nearly triangular, stalked, covered with short hairs; stalk somewhat longer than the calyx.

Leaflets grass-green, paler below, reticulate; stipules pale; flowers yellowish white. High alpine pastures. July—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

OXYTROPIS MONTANA DC. MOUNTAIN OXYTROPIS

LEGUMINOSÆ.

Plate 26.

Root cylindrical, branched, many-crowned, tufted. Stem very short or altogether wanting, leafy at the apex, like the whole plant covered with patent hairs. Leaves pinnate; pinnæ in 8—15 pairs ovate or lanceolate, acute, entire; stipules ovate or lanceolate, sessile at the base of the leaf-stalk. Flowers in compact roundish or ovate axillary spikes. Legume erect, elongated, inflated, covered with black hairs, semi-bilocular, distinctly stipitate within the calyx; stalk as long as the calyx-tube.

Root thick, putting up roundish spreading tufts; leaflets small blueish on the upper side, grass-green below; rachis of leaf reddish flowers bright violet-red. Stony pastures, rocks, and rocky places of the calcareous Alps; abundant. July—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

OXYTROPIS CAMPESTRIS DC. FIELD OXYTROPIS.**LEGUMINOSÆ.***Plate 27.*

Stemless, with scattered hairs, or slightly shaggy. Leaflets usually in 12 pairs, lanceolate, acute. Peduncle of inflorescence longer than the leaves, and like the calyx hairy; hairs erect, somewhat adpressed. Spikes capitate, ovate. Bracts nearly or quite as long as calyx. Legume erect, sessile within the calyx, ovate, inflated, pointed, semi-bilocular.

Flowers lemon-yellow with brownish claws. Stony places in the Alps. July—September.

Distribution.—Carpathians: Eastern, Central, and Western Alps (British).

DRYAS OCTOPETALA L. EIGHT-PETALLED DRYAS.**ROSACEÆ.***Plate 28.*

Stem somewhat shrubby, branched, prostrate, in flat cushions. Leaves evergreen, cordate-ovate, crenate, blunt, glabrous and shining on the upper side, white and hoary beneath; margin revolute; stipules lanceolate-subulate, like the calyx, leaf-stalk and flower-stalk more or less hairy; the calyx and upper part of the flower-stalks also furnished with short glandular hairs. Flowers solitary, terminal. Seed-vessel hairy.

On rocks and rocky debris of the calcareous Alps, common; from 5000 to 6500 feet, often descending into the subalpine zone. June—August.

Distribution.—Eastern, Central, and Western Alps; Jura. (British).

POTENTILLA AUREA L. GOLDEN POTENTILLA.

ROSACEÆ.

Plate 29.

Root tapering, branched, with several crowns, and putting up woody stems, tufted. Stem erect or ascending, like the calyx, leaf-stalk, and flower-stalk, covered with adpressed hairs, cymosely branched above, several-flowered. Leaves few, palmately 5-partite, or the upper ones tripartite, segments obovate or wedge-shaped, deeply veined above, uniform in colour, nearly glabrous above, shining on the under side from pale long silky adpressed hairs on the mid-rib, lateral veins, and margins of the leaf, as if marked with silver streaks, deeply serrate. Seed-vessel glabrous, not margined.

Leaves grass-green, shining; flowers moderately large; petals golden yellow, with an orange streak at the base. Abundant in alpine and subalpine pastures. June—Autumn.

Distribution.—Carpathians; Eastern and Western Alps; Erzgebirge; Jura.

POTENTILLA CAULESCENS GAUD. LONG-STALKED POTENTILLA.

ROSACEÆ.

Plate 30.

Root-stock cylindrical, vertical or oblique, with thick fibres, many-crowned, tufted; crowns thick, often elongated into short stems, but not sending out leafy stolons. Stem weak, prostrate, descending, ascending, or erect, many-leaved, cymosely branched at the apex, many-flowered, like the leaf-stalks covered with patent hairs. Root-leaves and lower stem-leaves palmately 5-partite, with longer or shorter stalks; the root-leaves shorter than those of the stem; upper stem-leaves tripartite, passing over into bracts; segments elongated or wedge-shaped, entire till above the middle, then serrate, uniform in colour, nearly glabrous on both sides, or silky-villous below and on the margin. Petals narrow, wedge-shaped, longer than the calyx-teeth. Stamens and seed-vessel hairy.

Stem limp, like the gray-green soft leaves; flowers white. Calcareous alpine and subalpine rocks, descending to the valleys. July—August.

Distribution.—Carpathians: Eastern, Central and Western Alps; Jura.

ROSA ALPINA L. ALPINE ROSE.**ROSACEÆ.***Plate 31.*

Prickles all straight, horizontal or pointing downwards, unequal, more or less crowded on the barren shoots, usually wanting on the flowering stems and branches. Leaves pinnate ; pinnæ in 3—5 pairs, elliptical, acute or obtuse, simply or doubly serrate, glabrous or hairy beneath, dark green on the upper, lighter on the under side. Flowers solitary ; flower-stalk pendent after flowering, usually without bracts. Calyx-teeth entire, broader near the apex, as long as or longer than the petals. Pseudocarp (hip) elliptical or less often globular, with a more or less contracted neck, and hence often flask-shaped, fleshy, drooping, crowned by the erect or closed persistent calyx-teeth. The axile ovules very shortly stalked or nearly sessile.

Flowers rose-red or purple, very fragrant ; hip scarlet ; stem 1—4 feet high. Margins of woods, stony and bushy places, and woody declivities ; often also on rocks in the alpine and subalpine regions. June—July.

Distribution.—Eastern, Central, and Western Alps ; Erzgebirge ; Vosges ; Jura.

**ALCHEMILLA PUBESCENS BIEB. HAIRY
LADIES' MANTLE.**

ROSACEÆ.*Plate 32.*

Root-leaves reniform, deeply 7—9-lobed ; lobes shortly obovate, cut, sharply serrate near the apex, entire at the base.

Meadows in the highest Alps. June—July.

Distribution.—Carpathians ; Eastern Alps.

**ALCHEMILLA ALPINA L. ALPINE LADIES'
MANTLE.**

ROSACEÆ.

Plate 33.

Root-stock cylindrical, knotted, oblique, with many fibres. Stem prostrate or ascending, branched, covered like the leaf-stalks with adpressed hairs. Leaves palmate, 5—9-partite, glabrous and dark green on the upper side, silver-gray, covered with shining silky hairs on the under side; segments wedge-shaped, obtuse, serrate towards the apex. Flowers in a terminal, branched, coiled, often racemose cyme. Stamens 2—4.

Flowers greenish yellow. Rocky places; not common. July—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Vosges; Jura. (British).

SEMPERVIVUM HIRTUM L. HAIRY HOUSE-LEEK.

CRASSULACEÆ.

Plate 34.

Root tapering, branched, putting up rosette-bearing stems. Stem erect or ascending, hairy like the flower-stalks and calyx. Leaves fleshy, entire, those of the rosettes linear-lanceolate, acute, ciliated, otherwise glabrous on both sides; stem-leaves crowded, sessile, lanceolate, ovate-lanceolate, or triangularly ovate, from a cordate base, acuminate, increasing upwards in breadth and size, ciliated, shortly hairy on both sides or on the under side only; the lower ones often glabrous on both sides. Flowers in terminal unilateral cymes. Petals usually 6, erect, linear-lanceolate, fringed at the margin, twice as long as the usually 6-parted calyx. corolla bell-shaped. Stamens usually 12. Carpels usually 6.

Flowers yellowish white. Rocks and stony grassy places in the Alps and mountain regions. July—Autumn.

Distribution.—Carpathians; Eastern and Western Alps; Erzgebirge.

SAXIFRAGA OPPOSITIFOLIA L. OPPOSITE- LEAVED SAXIFRAGE.

SAXIFRAGACEÆ.

Plate 35.

Stem creeping, much-branched ; branches erect, crowded, densely clothed with leaves, but the flowering stems less so above, 1-flowered. Leaves opposite, in 4 rows on the barren branches, provided at the thickened apex with a depression which detaches a calcareous scale that subsequently falls off, spatulate, strongly ciliated, otherwise glabrous, or like the stem very slightly hairy, carinate on the under side, hollow above with recurved apex. Calyx half 5-cleft ; calyx-tube adherent one-half of the way ; calyx-teeth roundish-ovate, not glandular, strongly ciliated. Petals obovate.

Flowers moderately large, rose-coloured, at length blue. Alpine rocks. May—June.

Distribution.—Carpathians ; Eastern, Central, and Western Alps ; Erzgebirge ; Jura. (British).

SAXIFRAGA CÆSIA L. GRAY SAXIFRAGE.

SAXIFRAGACEÆ.

Plate 36.

Root with branched fibres, putting up a cushion-like tuft from a stem densely imbricated with leaves. Stem squarely cylindrical, bearing at the apex a hemispherical rosette of leaves ; flowering stem erect or ascending, bearing a 1—6-flowered corymbose cyme ; like the stem-leaves, flower-stalk and calyx, glabrous or with a few glandular hairs. Lower leaves with recurved margins, hard, thick, glabrous, linear-lanceolate, nearly triangular, acute, entire, punctated at the margin, fringed at the base, when young calcareously encrusted ; stem-leaves much smaller, linear. Calyx-limb superior. Petals obovate, obtuse.

Flowers white. On rocks in the calcareous Alps, often ascending to the snow-line, and descending into the valleys with the debris of the mountain streams. June—September.

Distribution.—Eastern, Central, and Western Alps.

**SAXIFRAGA MUSCOIDES WULF. MOSSY
SAXIFRAGE.**

SAXIFRAGACEÆ.

Plate 37.

Root tapering, branched, putting up a tuft of shoots bearing terminal rosettes of leaves. Stem ascending, leafless with the exception of the bracts, or with from one to three leaves; bearing a 1—6-flowered cymose corymb, covered like the flower-stalk and calyx with glandular hairs, or glabrous beneath. Leaves nerveless when fresh, glabrous or slightly ciliated at the base, or quite covered with glandular hairs, sometimes undivided, linear or linear-lanceolate, entire, obtuse, sometimes narrowly wedge-shaped, 2—3-cleft at the apex, less often 5-cleft, with linear obtuse segments; all the leaves often undivided. Calyx-limb superior. Petals lanceolate or oval, obtuse, about as broad as the calyx-teeth.

Damp shady rocks on the high Alps. July—August.

Distribution.—Eastern, Central, and Western Alps.

(A very variable species. The plate, though named *Saxifraga Sequieri*, belongs more properly to this species).

SAXIFRAGA STELLARIS L. STARRY SAXIFRAGE.

SAXIFRAGACEÆ.

Plate 38.

Root tapering, fibrous, putting up a tuft of short shoots bearing at the apex alternate leaves or a rosette. Stem erect, leafless with the exception of the bracts, bearing a 3—many-flowered cymose corymb, covered like the whole plant with scattered glandular hairs. Leaves wedge-shaped or obovate, coarsely serrate near the apex. Calyx inferior, with revolute teeth. Petals lanceolate, contracted into a linear claw, rather acute, expanded like a star.

Leaves moderately thick, grass-green; petals small, white, with two yellow spots at the base, deciduous; anthers vermilion-red. Damp rocks and pastures, up to the melting snow. June—Autumn.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Vosges. (British).

SAXIFRAGA AIZOIDES L. YELLOW SAXIFRAGE.**SAXIFRAGACEÆ.***Plate 39.*

Root tapering, branched, putting up a tuft of leafy shoots, but no rosettes. Stem erect or ascending, leafy, bearing a 3—many-flowered racemose cyme, but often only 1—2-flowered, hairy like the flower-stalks and base of the calyx. Leaves glabrous, nerveless, undivided, linear or linear-lanceolate, more or less dentate-ciliated or entire, apiculate, alternate, crowded at the apex of the shoots. Calyx-limb half-superior. Petals linear-lanceolate, obtuse, about as broad as the calyx-teeth.

Leaves moderately thick, grass-green; flowers yellow, often nearly orange; stamens orange-yellow. Extremely abundant in damp rocky places, by the sides of streams, &c., in the Alps. July—Autumn.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Jura. (British).

**BUPLEURUM LONGIFOLIUM L. LONG-LEAVED
HARE'S-EAR.****UMBELLIFERÆ.***Plate 40.*

Root-stock cylindrical, oblique or horizontal, with several crowns. Stem erect, simple or somewhat branched above, cylindrical, finely furrowed, like the whole plant glabrous. Leaves entire, with longitudinal veins, acute; the lower ones obovate or elliptical, running down into a long leaf-stalk; the upper ones lanceolate or ovate, sessile, with a cordate amplexicaul base. Umbel 5—6-branched; general involucre 3—5-leaved; partial involucre 5—7-leaved; bracts ovate or elliptical, shortly apiculate, those of the partial involucre longer than the secondary umbels. Ridges of the fruit narrow; furrows smooth, in three courses.

Rocks and stony alpine places.

Distribution.—Eastern, Central, and Western Alps.

VALERIANA CELTICA L. CELTIC VALERIAN.**VALERIANACÆ.***Plate 41.*

Root-stock cylindrical, oblique or vertical, with several crowns; crowns covered with the scale-like remains of leaves. Stem erect, simple, furrowed, glabrous like the whole plant, furnished with one or less often two pairs of leaves in addition to the bracts. Leaves all undivided and entire, acute or obtuse; root-leaves obovate-lanceolate or wedge-shaped, narrowing into a foot-stalk; stem-leaves smaller, narrowly wedge-shaped, gradually narrowed towards the base, sessile. Flowers in a terminal paniculate cyme.

Stem 1—5 inches high; flowers a dull reddish yellow. Known from antiquity for its perfume, which pervades the whole plant, and especially the root. It is still largely used in baths, for perfuming clothes, protection against moth, &c.; and the gathering of "Speick" is a considerable industry in the higher mountains, where the plant abounds. Stony pastures of the higher Alps; although occurring in the calcareous Alps, the plant is especially characteristic of slate mountains, where it occurs in enormous quantities. July—August.

Distribution.—Eastern and Western Alps.

VALERIANA SAXATILIS L. ROCKY VALERIAN.**VALERIANACÆ.***Plate 42.*

Root-stock cylindrical, oblique or vertical, with several crowns; crowns tufted. Stem erect, simple, furrowed, glabrous, leafless with the exception of the bracts, or with a single pair of leaves near the middle. Leaves all undivided, entire or coarsely toothed, acute or obtuse, glabrous or with scattered hairs, shortly ciliated; root-leaves elliptical or ovate-lanceolate, narrowed into a foot-stalk; stem-leaves much smaller, linear-lanceolate, sessile. Flowers in a terminal umbellate cyme.

Flowers snow-white. On rocks in the calcareous and lower Alps. June—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge.

SCABIOSA LUCIDA VILL. SHINING SCABIOUS

DIPSACACEÆ.

Plate 43.

Lowermost root-leaves elongated, stalked, crenate; upper ones pinnatifid. Stem simple, terminating in a single violet or flesh-coloured capitulum.

Stony and rocky alpine and subalpine spots. June—Autumn.

Distribution. — Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Vosges; Jura.

ADENOSTYLES ALPINA L. ALPINE ADENOSTYLES.

COMPOSITÆ.

Plate 44.

Root-stock cylindrical, knotty, oblique or horizontal, covered with long thick fibres. Stem erect or ascending, like the leaves downy; ending in a much-branched umbellate paniculate corymbose inflorescence. Leaves nearly round, kidney-shaped, or triangular, the uppermost often lanceolate, acute or obtuse, dentate, glabrous or with scattered glands above; reticulately veined on the under side, and more or less thickly coated on the veins with simple or branched hairs. Capitula 2—6-flowered, tufted.

Stem $\frac{1}{2}$ —1 feet high, like the involucre often purple; flowers light purple or flesh-coloured. Moist shady alpine or subalpine situations, often descending to the valleys. June—September.

Distribution.—Eastern, Central, and Western Alps; Jura.



ASTER ALPINUS L. ALPINE ASTER.

COMPOSITÆ.

Plate 45.

Root-stock cylindrical, knotty, oblique, covered with long fibres, branched above, often putting up sterile tufts of leaves in addition to the stem. Stem erect or ascending, like the leaves shaggy or covered with short hairs, bearing a single capitulum, beneath which it is often thicker and hollow, otherwise solid. Leaves 3-nerved, wavy, entire, the lower ones wedge-shaped or spatulate, narrowed into a foot-stalk, obtuse; upper ones linear-lanceolate or lanceolate, sessile, acute. Ray-flowers ligulate, female. Bracts of the involucre lanceolate, more or less acute, ciliated, all nearly uniform in length and herbaceous, usually with a recurved apex.

Ray-flowers violet-blue; disc-flowers yellow; capitulum handsome. On rocks, rocky and stony places and pastures in the Alps and lower Alps. July—August.

Distribution.—Carpathians: Eastern, Central, and Western Alps; Erzgebirge; Jura.

**BELLIDIASTRUM MICHELLII CASS. MICHEL'S
BELLIDIASTRUM.**

COMPOSITÆ.

Plate 46.

Root-stock cylindrical, knotty, covered with long fibres. Stem erect or ascending, leafless, simple, terminating in a single capitulum, like the leaves shaggy or covered with short soft hairs. Leaves all radical, lanceolate-obovate, narrowed into a foot-stalk, coarsely serrate, obtuse.

Leaves soft, dull green; capitulum large. Resembles a very large daisy, but distinguished by the hairy pappus. From the sub-alpine regions upwards to the higher Alps; usually abundant. May—Autumn.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest, Jura.

ERIGERON ALPINUS L. ALPINE FLEA-BANE.

COMPOSITÆ.

Plate 47.

Root-stock cylindrical, knotty, oblique, covered with fibres. Stem erect or ascending, like the leaves covered with rough hairs or nearly smooth, simple or branched, bearing one or several capitula. Leaves alternate, entire, the lower ones narrowly wedge-shaped or spatulate, obtuse, narrowed into a foot-stalk; upper ones lanceolate, acute, sessile. Outer ray-flowers narrowly ligulate, female, nearly twice as long as the perfect disc-flowers: inner female flowers tubular, filiform, equalling the disc-flowers in length, erect.

Capitulum resembling that of *Aster alpinus*; disc yellow; ray a more or less dark purple. Alpine and subalpine pastures and stony places, often descending considerably. June—August.

Distribution.—Carpathians: Eastern, Central, and Western Alps; Jura. (British).

GNAPHALIUM LEONTOPODIUM L. EDELWEISS.

COMPOSITÆ.

Plate 48.

Root-stock cylindrical, knotty, oblique, tufted, covered with fibres. Stem erect, simple, covered with a white woolly felt. Leaves entire, obtuse, more or less covered on the upper side with white hairs, on the under side with a white woolly web; lower leaves narrowly wedge-shaped; upper ones linear-lanceolate. Capitula ovate, congregated in an umbellate manner at the apex of the stem, surrounded by elliptical woolly involueral bracts.

Stem 1–6 inches high; leaves gray or green above; the terminal radical capitulum 1–2 inches in diameter; flowers yellowish. Very steep rock-precipices, and stony alpine pastures. Now makes an important article of traffic to tourists, and largely imported from other countries. July—Autumn.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

(The drawing represents mature stage of development).

**ARTEMISIA MUTELLINA VILL. SMALLER
WORMWOOD.**

COMPOSITÆ.

Plate 49.

Cæspitose ; many-stemmed. Stem simple, 3—6 inches high. Leaves gray, with silky adpressed hairs ; the lowermost doubly or triply tripartite ; upper leaves digitately divided ; segments all linear. Capitula in twos or fours at the summit of the stem ; uppermost nearly sessile and crowded ; the two or three lower ones somewhat less close.

Rocky exposed places in the higher Alps. July—August.

Distribution.—Eastern, Central, and Western Alps.

ACHILLEA CLAVENÆ L. BITTER MILFOIL.

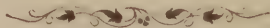
COMPOSITÆ.

Plate 50.

Root-stock cylindrical, knotty, branched. Stem erect, like the leaves covered with a gray felt of silky hairs, bearing at the summit a large number of capitula, arranged in a corymbose raceme. Leaves obovate-lanceolate or wedge-shaped, simply pinnatifid, with linear entire 2—3-toothed, obtuse teeth. Ray-flowers 6—8, as long as or longer than the involucre.

Root-stock thick, black ; stem 3—8 inches high ; capitula large ; involucre bracts with a black margin ; ray white ; disc yellowish. On rocks and debris of the calcareous Alps, 5000—6500 feet, very abundant, occasionally descending to the lower Alps.

Distribution.—Carpathians ; Eastern, Central, and Western Alps.



ACHILLEA NANA L. DWARF MILFOIL.**COMPOSITÆ.***Plate 51.*

Leaves very woolly, narrowly lanceolate, pinnate; pinnæ of the stem-leaves enlarged at the base by a lobe, bifid; teeth linear-lanceolate, acute, unequal: those of the root-leaves bifid, the anterior tooth 3-cleft, posterior one bifid. Inflorescence simple, nearly globular. Ligulate flowers as long as the involucre.

Flowers white. On the highest slate-mountains. July—August.

Distribution. —Eastern, Central, and Western Alps.

ARONICUM CLUSII NECK. CLUSIUS'S ARONICUM.**COMPOSITÆ.***Plate 52.*

Root-stock cylindrical, oblique or horizontal, with several crowns, covered with long thick fibres, often putting up cylindrical underground stolons. Stem erect or ascending, more or less covered like the leaves with rough hairs, nearly destitute of glands or almost glabrous, simple. Leaves linear-lanceolate; root-leaves often oval, entire or coarsely dentate or with wavy margin; the lower ones stalked, often narrowing into a foot-stalk, or auricled; the upper ones usually with a narrowed, less often with a rounded base, sessile; rapidly decreasing in size upwards. Capitulum solitary. Disc-flowers radiate.

Root-stock bitter, with a sharp after-taste; stem nearly naked; capitulum large; flowers bright yellow. Rocks and stony pastures, and on debris on the calcareous Alps.

Distribution. —Carpathians: Eastern, Central, and Western Alps.

ARNICA MONTANA L. MOUNTAIN ARNICA.

COMPOSITÆ.

Plate 53.

Root-stock cylindrical, oblique, covered with long fibres. Stem erect, bearing from 1 to 3 capitula, glandular-villous, with one or two pairs of leaves, naked above. Leaves nearly entire, acute, downy or glabrous; root-leaves in rosettes, obovate-lanceolate, narrowed into a short foot-stalk; stem-leaves opposite, linear-lanceolate, sessile, much smaller. Ray-flowers radiate.

Stem 1—1½ feet high; capitula large, 2½—3 inches in diameter; flowers bright or orange-yellow. A well known bitter medicinal plant. Alpine and subalpine meadows and pastures. May—June.

Distribution.—Carpathians: Eastern, Central, and Western Alps; Erzgebirge; Sarmatian Plain; Black Forest; Vosges; Jura.

CENTAUREA MONTANA L. MOUNTAIN CENTAURY.

COMPOSITÆ.

Plate 54.

Root-stock cylindrical, knotty, oblique or premorse, with several crowns, covered with long fibres. Stem erect or ascending, simple or slightly branched above, like the leaves covered with a gray woolly felt. Leaves elliptical, linear-lanceolate or lanceolate, acute or acuminate, entire, serrulate, or pinnatifid; lower leaves narrowed into a foot-stalk; upper stem-leaves decurrent. Involucral bracts ovate or lanceolate, anastomosingly veined, adpressed, with a membranous margin at the apex; fringed or serrate. Ray-flowers radiate. Pappus one-third as long as achene.

Stem ½—1 foot high; leaves soft; ray-flowers bright blue; disc-flowers reddish violet; leaves nearly glabrous or covered with adpressed woolly hairs. Alpine and subalpine pastures and margins of woods, especially in stony and bushy places.

Distribution.—Eastern, Central, and Western Alps; Erzgebirge; Vosges; Jura.

(The figure rather more nearly resembles the closely-allied *C. axillaris*).

MULGEDIUM ALPINUM LESS. ALPINE MULGEDIUM.

COMPOSITÆ.

Plate 55.

Root-stock cylindrical, oblique or horizontal, covered with thick fibres. Stem erect, simple or branched near the top, covered below with stiff hairs, then glabrous: near the top, like the bracts and involucre, covered with glands and bristles. Leaves lyrate, very coarsely serrate, mostly or entirely glabrous: lowermost stalked; upper ones sessile, amplexicaul, with cordate auriculate base; segments linear or lanceolate, unequally toothed, triangular, or lanceolate. Achenes smooth, longitudinally furrowed.

Stem 2–5 feet high, reddish; leaves grass-green on the upper side, reddish below; ray-flowers bright violet, soon withering. Rocky declivities, ravines, margins of woods, and damp spots in the Alps and lower Alps.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Black Forest; Vosges; Jura.

(The figure perhaps more closely resembles the nearly allied *M. Plumieri*).

LEONTODON PYRENAICUS GOUAN. PYRENEAN DANDELION.

COMPOSITÆ.

Plate 56.

Root-stock cylindrical, oblique, perennate, covered with thickish fibres. Stem erect or ascending, leafless, like the root-leaves glabrous or covered with simple hairs, simple, gradually thickened upwards, and bearing there a few distant or closer linear scales; like the involucre glabrous or downy with long white hairs, or villous from long dusky or nearly black hairs. Leaves all radical, linear-lanceolate or wedge-shaped, acute or obtuse, shallowly serrate, with wavy margin, or entire, narrowed into a naked leaf-stalk. Capitulum solitary, pendent before flowering. Style yellow. Inner rays of the pappus pinnate; outer ones few in number, rough, much shorter. Receptacle pitted, not ciliated.

Flowers golden or saffron-yellow. Alpine and subalpine pastures.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Vosges.

(The figure more nearly represents *L. Taraxaci*).

HIERACIUM AURANTIACUM L. ORANGE-FLOWERED HAWKWEED.

COMPOSITÆ.

Plate 57.

Root-stock cylindrical, knotty, oblique or premorse, covered with long fibres: putting up creeping underground stolons and barren tufts of leaves as well as flower-stems, rarely also leafy stolons above the soil. Stem erect, scape-like, very rough with stellate and long simple hairs, bearing from 1 to 3 leaves on the lower part, leafless above, terminating in from two to a large number of umbellately arranged capitula, rarely only one. Leaves grass-green, ovate, linear-lanceolate or wedge-shaped, entire, acute or obtuse, sessile or narrowed into a foot-stalk, more or less rough with long simple but not stellate hairs. Stalk of capitula and involucre densely covered with stellate hairs, black glandular bristles, and long black hairs. .

Flowers dark orange. Alpine pastures: often in great abundance. June—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Black Forest; Vosges; Jura.

HIERACIUM PORRIFOLIUM L. NARROW-LEAVED HAWKWEED.

COMPOSITÆ.

Plate 58.

Root-stock vertical, simple above or slightly branched; not putting up stolons. Stem erect, leafy, glabrous, loosely paniculate. Stalk of capitula scaly above, and like the involucre nearly glabrous, or grayish with a finely stellate down. Leaves blueish-green, linear, acuminate, glabrous or ciliated at the base, entire, or with a few slight teeth. Involucral bracts obtuse, adpressed.

Stem $\frac{1}{2}$ —1 foot high; leaves rather thick, very narrow, blueish-green; flowers bright yellow. Sandy alpine and subalpine places, among debris and boulders. June—Autumn.

Distribution.—Eastern, Central, and Western Alps; Jura.

(The plate is misnamed *H. staticifolium*).

HIERACIUM VILLOSUM JACQ. VILLOUS HAWK-WEED.

COMPOSITÆ.

Plate 59.

Root-stock cylindrical, knotty, oblique or premorse, covered with thick fibres. Stem erect, leafless or with one or more leaves, simple or branching above into from one to five branches, each bearing a capitulum, like the stalks of the capitulum and involucre covered with stellate hairs, as well as villous with simple white hairs usually black at the base, or rough, or glabrous below, wanting the glandular coating. Leaves gray or blueish-green, thin, acute or acuminate, entire or shallowly dentate, villous or rough on both sides or only on the margin, or the lower leaves glabrous; the root and lowest stem-leaves linear-lanceolate, elliptical or wedge-shaped, sessile or narrowed into a more or less distinct foot-stalk; upper stem-leaves ovate or ovate-lanceolate, sessile, with rounded somewhat cordate base, or lanceolate and narrowed below; less often stem-leaves altogether wanting. Limb of the ligulate flowers glabrous or slightly hairy or ciliated.

A very variable species. Capitulum large; flowers bright yellow. Rocks and rocky pastures of the calcareous Alps. July—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Erzgebirge; Jura.

PHYTEUMA CONFUSUM KERN. FEW-FLOWERED RAMPION.

CAMPANULACEÆ.

Plate 60.

Leaves spatulate or narrowly wedge-shaped, gradually broader upwards, and 3-notched at the apex, usually ciliated at the base, otherwise glabrous. Bracts bluntly apiculate from a broad ovate base, ciliated, entire or slightly toothed; involucre bracts two or three times broader. Capitulum spherical. Calyx-teeth 3-nerved, glabrous. Corolla dark blue, divided almost to the base into five narrowly linear petals suddenly narrowing from an ovate base.

In meadows and on rocks in the Styrian and Carinthian Alps, on slate and gneiss. July—August.

Distribution.—Eastern Alps.

(The plate is misnamed *P. pauciflorum*, a closely-allied species).

CAMPANULA BARBATA L. BEARDED BELL-FLOWER.**CAMPANULACEÆ.***Plate 61.*

Root tapering, branched, thick, at length woody, with several crowns. Stem erect, obtusely angled, rough-haired like the whole plant. Leaves entire or slightly crenate, wavy; the lowermost linear-lanceolate, acute or obtuse, narrowed into a foot-stalk; upper ones lanceolate, obtuse, sessile. Flowers stalked, in a simple or compound raceme, usually all pendent to one side. Calyx-teeth linear-lanceolate; appendages to calyx nearly as long as calyx-tube. Limb of corolla bearded with long hairs. Capsule nodding.

Stem rather bare of leaves, 1—10-flowered; leaves bright green; corolla bell-shaped, a light violet-blue. Alpine and subalpine meadows and pastures. July—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Jura.

CAMPANULA PULLA L. DARK BLUE BELL-FLOWER.**CAMPANULACEÆ.***Plate 62.*

Root tapering, loosely tufted, putting out filiform underground stolons, and, in addition to the flowering stems, barren rosettes of leaves. Stem erect or ascending, obtusely angled, like the leaves glabrous or with a few scattered hairs, leafless in the upper part, 1-flowered. Leaves crenate; root-leaves, and the lower stem leaves roundish, ovate, or elliptical, acute or obtuse, shortly stalked, longer than the leaf-stalk; median stem-leaves longer, narrower, acute, sessile; uppermost often lanceolate. Flowers terminal. Calyx-teeth triangular. Capsule nodding.

Corolla bell-shaped, comparatively large, dark violet. Pastures, woods, and bushy and stony places in the calcareous and lower Alps. June—August.

Distribution.—Eastern Alps.



CAMPANULA PUSILLA HÆNK. DWARF BELL-FLOWER.

CAMPANULACEÆ.

Plate 63.

Stem 2—4 inches high, bearing a 3—5-flowered raceme. Leaves of the barren root-shoots roundish, coarsely serrate, slightly cordate, much shorter than the leaf-stalk. Calyx-teeth linear, scarcely one-third as long as corolla. Corolla hemispherico-campanulate.

Flowers a pale violet-azure. Gravelly alpine and subalpine places, descending the beds of streams to the plains. June—September.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Vosges; Jura.

AZALEA PROCUMBENS L. PROCUMBENT AZALEA.

ERICACEÆ.

Plate 64.

A procumbent shrubby plant, the stem much divided into interwoven branches, and forming flat cushions. Leaves oval or lanceolate, entire, obtuse, with revolute margin, rigid, evergreen, glabrous like the whole plant. Flowers collected into a 2—4-flowered umbellate inflorescence at the end of the branches.

Leaves very small, shining; corolla small, rose-colored; calyx and capsule purple-brown. Contains an acrid-narcotic substance. Alpine pastures, often covering large tracts with its cushion-like masses.

Distribution.—Carpathians; Eastern, Central, and Western Alps. (British).



RHODODENDRON FERRUGINEUM L. RUSTY-LEAVED ALPINE ROSE.

ERICACEÆ.

Plate 65.

An erect, branched, shrubby plant. Leaves linear-lanceolate to elliptical, obtuse, entire or finely crenate, somewhat revolute at the margin, glabrous, not ciliated, coriaceous, evergreen, dark green and shining on the upper side, covered on the under side when young by densely packed yellowish resinous finally coalescent glands, when older rusty-brown beneath. Flowers in terminal corymbs, nodding on erect flower-stalks. Calyx-teeth shortly ovate, obtuse, broader than long, only slightly ciliated, or not at all. Corolla funnel-shaped, dotted on the outside, like the glabrous flower-stalk, calyx, and ovary, with resinous glands.

Leaves more crowded than in *R. hirsutum*, more coriaceous, and comparatively broader; flowers on longer stalks, and corymbs looser. Conspicuous from the cinnamon-brown leaves of the previous year. June—July.

Distribution.—Eastern, Central, and Western Alps; Jura.

RHODODENDRON HIRSUTUM L. HAIRY ALPINE ROSE.

ERICACEÆ.

Plate 66.

An erect branched shrubby plant. Leaves elliptical, ovate, or obovate, obtuse, finely crenate, the margin not revolute, or at most somewhat recurved, more or less strongly ciliated, otherwise glabrous, cartilaginous, evergreen, dark green above, shining, covered on the under side by scattered or crowded but not coalescent, resinous, at first yellowish, finally rusty-brown glands. Flowers in terminal corymbs, nodding on erect flower-stalks. Calyx-teeth lanceolate or ovate-lanceolate, acute, longer than broad, serrato-ciliate towards the apex, but some of them occasionally ovate, obtuse, broader than long, not ciliated. Corolla funnel-shaped, dotted on the outside, like the glabrous or stiff-haired flower-stalk, calyx, and ovary, with resinous glands.

The colour of the flowers, and the myrtle-green of the leaves, are among the most beautiful adornments of the Alps; immense districts being often clothed in summer with a rose-coloured carpet, which often

also covers the walls of rock with the most beautiful tapestry. Commencing below the region of *Pinus Mughus*, and often descending lower with the beds of streams, the region of the alpine rose ascends to a height of 6500 feet.

Distribution.—Eastern, Central, and Western Alps.

PYROLA UNIFLORA L. ONE-FLOWERED WINTER-GREEN.

ERICACEÆ.

Plate 67.

Stem erect, 1-flowered, leafless except at the base. Leaves ovate, roundish, spatulate, acute or obtuse, finely serrate, usually in rosettes. Corolla shallow, nodding.

Stem 1—4 inches high, slender. Corolla large, yellowish white. Margins of woods, shady, and mossy places in the lower Alps, as high as the region of *Pinus Mughus*, and descending into the plains. June—July.

Distribution. — Erzgebirge; Eastern, Central, and Western Alps; Vosges. (British).

PYROLA ROTUNDIFOLIA L. ROUND-LEAVED WINTER-GREEN.

ERICACEÆ.

Plate 68.

Stem erect, leafless except at the base. Leaves roundish or ovate, obtuse, entire or obsoletely crenate. Raceme not unilateral, loose, usually many-flowered. Calyx-teeth ovate-lanceolate or lanceolate, longer than broad, acuminate, with the apex finally recurved, half as long as the shallow widely open corolla. Stamens curved upwards. Style bent downwards, with the apex ascending, thickened above in a ring, and there as wide as or wider than the stigma, projecting from the corolla.

Stem and leaf-stalks green or reddish; flowers white. Shady alpine and subalpine woods. June—July.

Distribution.—Eastern, Central, and Western Alps. (British).

GENTIANA PANNONICA SCAP. HUNGARIAN GENTIAN.

GENTIANACEÆ.

Plate 69.

Root thick, cylindrical, vertical, at length branched, with several crowns. Stem erect or ascending, single, few-leaved. Leaves of the barren shoots and lower stem-leaves elliptical, acute or shortly acuminate, 5—7-nerved, stalked, with sheathing leaf-stalk; upper ovate-lanceolate or lanceolate, acuminate, 3-nerved, sessile. Flowers solitary or in clusters of from 2—5 in the axils of the uppermost opposite leaves, forming a false whorl, the uppermost coalescing into a terminal head. Calyx-teeth recurved. Corolla campanulate, 5—7-cleft; teeth not fringed; throat naked.

Corolla 1—1½ inch long, dull purple with pale greenish yellow base, spotted and streaked with black. Root very bitter. Alpine and subalpine pastures, more common on limestone than slate. July—August.

Distribution.—Carpathians; Erzgebirge; Eastern Alps.
(The plate is misnamed *Gentiana purpurea*).

GENTIANA PUNCTATA L. DOTTED GENTIAN.

GENTIANACEÆ.

Plate 70.

Stem-leaves sessile, nerved; the lower ones elliptical, stalked. Flowers in whorls. Calyx campanulate; calyx-teeth erect, lanceolate. Corolla 6-cleft, campanulate; teeth a quarter the length of corolla-tube; throat naked.

Flower bright yellow, with dark gray spots. Grassy sunny spots in the Alps. July—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps.

GENTIANA ASCLEPIADEA L. ASCLEPIAS-LIKE GENTIAN.

GENTIANACEÆ.

Plate 71.

Root-stock cylindrical, knotty, oblique or premorse, covered with thick fibres, several-crowned. Stem erect, simple, leafy except at the base. Stem-leaves lanceolate or ovate-lanceolate, acuminate, 5-nerved, sessile from a rounded or cordate base; no root-leaves. Flowers solitary or in clusters of 2 or 3, in the axils of the uppermost opposite leaves, forming a terminal, leafy, spicate or unilateral cyme. Corolla campanulate, 5-cleft, teeth not fringed; throat naked.

Stem $\frac{1}{2}$ —3 feet high, rigid, many-flowered, erect or pendent; corolla large, $1\frac{1}{2}$ —2 inches long, dark azure-blue, variegated internally with white streaks and dark spots. Common in woody subalpine regions and alpine pastures, up to 5000 feet. August—September.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Vosges; Jura.

GENTIANA ACAULIS L. STEMLESS GENTIAN.

GENTIANACEÆ.

Plate 72.

Root-stock cylindrical, oblique, premorse, covered with thick fibres, several-crowned. Stem erect, simple, few-leaved, usually short, often almost wanting. Root-leaves in rosettes, elliptical or lanceolate, acute, 1—3-nerved; stem-leaves much smaller, sessile. Flower solitary, terminal. Corolla campanulate, 5-cleft; teeth not fringed; throat naked.

Stem from very short to over 2 inches high; root-leaves 3—10 lines broad; corolla $1\frac{1}{2}$ inches, or in very lofty situations scarcely 1 inch long, dark azure-blue, always with 5 light streaks in the throat, dotted with dark violet. Stony pastures in the calcareous Alps, from 2000—6000 feet; often very abundant, usually in large masses. May—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Ardennes; Jura.

GENTIANA BAVARICA L. BAVARIAN GENTIAN.**GENTIANACEÆ.***Plate 73.*

Root tapering, fibrous, putting up filiform brittle stolons and leafy shoots, in addition to the flowering stems. Stem erect or ascending, simple, leafy, 1-flowered. Leaves obovate or nearly spatulate, obtuse, slightly 3-nerved, all crowded except sometimes the uppermost three or four pair, imbricate, the lowermost not in rosettes. Corolla saucer-shaped, 5-cleft; tube cylindrical; teeth not fringed; throat naked. Style deeply 2-cleft.

Flower handsome, deep azure-blue. Pastures of the higher calcareous Alps, often in great masses. July—September.

Distribution.—Eastern, Central, and Western Alps.

GENTIANA VERNA L. VERNAL GENTIAN.**GENTIANACEÆ.***Plate 74.*

Root tapering, fibrous, tufted, putting up filiform branched brittle stolons and leafy shoots, in addition to the flowering stems. Stem erect or ascending, simple, few-leaved, 1-flowered. Leaves ovate, elliptical, or lanceolate, acute, slightly 3-nerved; the lowermost larger, in rosettes, the upper 1 or 2 pairs distant. Corolla saucer-shaped, 5-cleft; limb cylindrical; teeth not fringed; throat naked. Style undivided.

Flower handsome, a lighter or darker azure-blue, varying considerably. Alpine and subalpine meadows and pastures, very abundant, and often in clusters of 50 or more flowers together. Descends far into the plains. April—July.

Distribution. — Carpathians; Erzgebirge; Sarmatian Plain; Eastern, Central, and Western Alps; Black Forest; Jura. (British).

GENTIANA OBTUSIFOLIA WILLD. BLUNT-LEAVED GENTIAN.

GENTIANACEÆ.

Plate 75.

Leaves sessile, lanceolate, obtuse; root-leaves obovate; uppermost ovate-lanceolate, acute. Calyx 5-toothed; teeth linear-lanceolate, nearly equal. Corolla 5-cleft, bearded in the throat.

Flower blueish or reddish violet, rarely white. Alpine pastures. July—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps.

LINARIA ALPINA MILL ALPINE TOADFLAX.

SCROPHULARIACEÆ.

Plate 76.

Root tapering, fibrous. Stem procumbent, or ascending at the apex, simple or branched, like the leaves glabrous and blueish-glaucous. Leaves sessile, linear or linear-lanceolate, obtuse, entire, in whorls of 3 or 4, or the upper ones alternate. Flowers in short loose racemes; flower-stalk as long as the calyx, and, like it, glabrous. Seeds elliptical, flat, smooth, surrounded by a membranous rim.

Stem weak, prostrate or decumbent, or expanded into a circular cushion. Corolla large, azure-violet, with orange lip. Rocks and debris in the calcareous Alps and lower Alps, abundant, descending into the valleys, especially in the dry beds of streams. July—Autumn.

Distribution.—Eastern, Central, and Western Alps.

**PEDICULARIS VERTICILLATA L. WHORLED
LOUSEWORT.**

SCROPHULARIACEÆ.

Plate 77.

Root tapering, branched. Stem erect or ascending, simple, leafy, like the leaves nearly glabrous or with 4 rows of hairs, somewhat longer than the root-leaves. Leaves pinnate or pinnatifid, with narrow unequally serrate segments; stem-leaves opposite or in whorls of 3 or 4. Flowers in a crowded terminal verticillate spike leafy at the base. Calyx ovate, inflated, with long hairs on the nerves, obliquely truncate, 5-toothed; upper lip short. Corolla glabrous; upper lip not beaked. Capsule ovate-lanceolate, with an acute apex, glabrous, longer than the calyx.

Many tufted stems often proceeding from the root; leaves grass-green; flowers rose to purple. Alpine pastures and rocky places. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

ERINUS ALPINUS L. ALPINE BALSAM.

SCROPHULARIACEÆ.

Plate 78.

Cæspitose. Leaves spatulate, serrate in the upper half. Calyx 5-partite. Corolla saucer-shaped, with a slender tube, and unequally 5-partite limb.

Flowers red, violet when dry. Rocky grassy alpine pastures. May—July.

Distribution.—Central and Western Alps; Jura.

PINGUICULA ALPINA L. ALPNIE BUTTERWORT.**LENTIBULARIACEÆ.***Plate 79.*

Root fibrous. Leaves all in radical rosettes, lanceolate or obovate-lanceolate, obtuse, entire, with revolute margin, thick, like the whole plant covered with viscid glands. Stem erect, leafless, 1-flowered. Corolla pendent; spur gibbous, shorter than the corolla.

Flower white, often with citron-yellow spots on the central lobe and at the apex of the spur. Rocks and stony pastures, and in damp mossy alpine and subalpine places; abundant. Blossoms from the melting of the snow till July.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Black Forest; Jura. (British).

PINGUICULA VULGARIS L. COMMON BUTTERWORT.**LENTIBULARIACEÆ.***Plate 80.*

Root fibrous. Leaves all in radical rosettes, lanceolate or obovate-lanceolate, obtuse, entire, with recurved margin, thick, like the whole plant covered with glandular hairs. Stem erect, leafless, 1-flowered. Corolla pendent; spur subulate, slender, about half the length of corolla.

Flower violet. Turfy meadows and damp places, ascending to 4500 feet, but not a true alpine plant. May—July.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Black Forest; Vosges; Jura. (British).



ANDROSACE CHAMÆJASME L. HAIRY ANDROSACE.**PRIMULACEÆ.***Plate 81.*

Root tapering, fibrous, tufted, putting up shoots which end in rosettes. Leaves elliptical or oblanceolate, entire, acute or obtuse, villous at the margin, like the stem, involucre, flower-stalks, and calyx, with long simple jointed hairs. Flowers in umbels surrounded by an involucre; involucrel bracts lanceolate or linear-lanceolate, shorter than or equalling the flower-stalks.

Rosettes usually crowded; corolla small, white or rose-colored: throat yellow. Alpine pastures and stony places. May—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

ANDROSACE LACTEA L. MILK-WHITE ANDROSACE.**PRIMULACEÆ.***Plate 82.*

Root tapering, fibrous, tufted, putting up shoots which end in rosettes. Leaves linear or linear-lanceolate, entire, acute, glabrous, only slightly ciliated towards the apex. Stem, involucre, flower-stalks, and calyx glabrous. Involucrel bracts very small, linear-lanceolate, much shorter than the flower-stalks. Flower sometimes solitary, and then without an involucre.

Flower white, with a golden yellow disc at the throat. Rocky places in the calcareous Alps, often in large dense masses. June—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps.

ANDROSACE **OBTUSIFOLIA** ALL. **BLUNT-LEAVED**
ANDROSACE.

PRIMULACEÆ.

Plate 83.

Root tapering, fibrous, tufted, putting up shoots which end in rosettes. Leaves oblanceolate, entire, acute or obtuse, finely ciliated, otherwise glabrous. Stem, involucre, flower-stalks, and calyx covered with a short pubescence formed of simple and stellate hairs. Involucral bracts lanceolate, shorter than or equalling the flower-stalks.

Umbels 2—6-flowered; corolla white with a yellow throat. On rocks and in stony pastures in the higher calcareous Alps; not so common as *A. Chamæjasme*.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps.

SOLDANELLA **ALPINA** L. **ALPINE SOLDANELLA.**

PRIMULACEÆ.

Plate 84.

Root-stock cylindrical, knotty, oblique, covered with fibres, with several crowns. Leaves all radical, stalked, roundish-cordate or reniform, coriaceous, glabrous, entire, margin wavy or shallowly crenate. Stem erect, leafless, like the flowers and flower-stalks glabrous or rough with sessile glands, or pubescent from glandular hairs. Flowers nearly erect, nodding, or pendent, in a terminal 1—10-flowered umbel; fruiting flower-stalk elongated, rigid, erect. Corolla campanulate-funnel-shaped, divided half way down; bearing in the throat five ovate membranous scales between the stamens and at their base. Anthers about twice as long as filaments.

Leaves dark-green, shining, dotted on the under side, often tinted with purple; flower 4—6 lines long, slightly viscid, bright violet; style sometimes longer, sometimes shorter than corolla (dimorphic). Variable; a less elevated stronger form being known as *S. montana*. Moist alpine and subalpine spots; appearing immediately after the melting of the snow in alpine pastures, both on limestone and slate. April—August.

Distribution.—Erzgebirge; Eastern, Central, and Western Alps; Black Forest; Jura.

SOLDANELLA PUSILLA L. DWARF SOLDANLLEA.**PRIMULACEÆ.***Plate 85.*

Root-stock cylindrical, knotty, oblique, covered with fibres, with several crowns. Leaves all radical, stalked, roundish or reniform from a cordate or rounded base, or occasionally orbicular, glabrous, coriaceous, margin entire or wavy. Stem erect, leafless, 1—2-flowered, like the leaf and flower-stalks rough with sessile glands. Flowers nodding or pendent; fruiting flower-stalk elongated, rigid, erect. Corolla campanulate-funnel-shaped, divided about half way down, destitute of scales. Anthers about as long as filaments.

Flowers bright violet with darker streaks. The higher Alps; usually on the melting snow. June—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

(The plate is possibly taken from *S. minima*).

CORTUSA MATTHIOLI L. MATTHIOL'S CORTUSA.**PRIMULACEÆ.***Plate 86.*

Root-stock cylindrical, oblique or premorse, covered with fibres. Stem erect, leafless, densely villous below like the leaf-stalk, covered in the upper part, like the flower-stalks, with shorter, weaker hairs. Leaves all radical, on long stalks, roundish-cordate, palmately lobed, glabrous on the upper side, hairy below and on the margin; lobes obtuse, coarsely toothed. Flowers in a loose terminal umbel, nodding on one side; involucre bracts lanceolate, entire or serrate or deeply toothed at the apex.

Stem 3 inches to 1 foot high, 3—many-flowered; corolla small, light purple, faintly fragrant. Damp shady woods or moist overflowed spots, on debris or in ravines, in the calcareous lower Alps up to the region of *Pinus Mughus*. May—July.

Distribution.—Eastern and Western Alps.

PRIMULA SPECTABILIS TRATT. LARGE-FLOWERED PRIMULA.

PRIMULACEÆ.

Plate 87.

Leaves lanceolate or elliptic-lanceolate, entire, glabrous, with cartilaginous margin, very shortly ciliated or serrulate. Scape of umbel 1—3-leaved, somewhat rough; involucral bracts linear, equalling or larger than the flower-stalks. Calyx tubular-campanulate, shorter than the corolla-tube.

Flower purple, large. Stony pastures and rocks, descending to the lower Alps. June—August.

Distribution.—Eastern Alps.

PRIMULA VILLOSA JACQ. DOWNY PRIMULA.

PRIMULACEÆ.

Plate 88.

Viscid with glandular hairs. Leaves obovate, wedge-shaped, or roundish, narrowed into a foot-stalk, crenate. Flowers stalked, involucral bracts shorter than flower-stalk. Calyx cup-shaped, half as long as corolla-tube, twice as long as capsule. Tube of corolla white.

Flowers light purple. Rocky places in the primitive and transitional strata. May—July.

Distribution.—Eastern, Central, and Western Alps.



PRIMULA AURICULA L. AURICULA.**PRIMULACEÆ.***Plate 89.*

Root-stock cylindrical, knotty, oblique or vertical, densely covered with fibres, with several crowns. Leaves all radical, obovate or lanceolate, narrowed towards the base, obtuse, entire or with wavy or toothed margin, glabrous on the upper side, downy beneath and on the margin with fine glands, when young more or less mealy and rolled up. Stem erect, leafless, glabrous, or, like the flower-stalks and calyx, covered with a white powder, or downy with fine glands. Flowers in a terminal, 1—many-flowered umbel, on longer or shorter stalks; involucrel bracts oval, obtuse. Calyx shortly campanulate, $\frac{1}{2}$ — $\frac{1}{3}$ the length of corolla-tube; calyx-teeth obtuse. Segments of corolla emarginate.

Leaves coriaceous, blueish green; corolla yellow, fragrant, mealy towards the throat, 8—10 lines in diameter. Rocks and rocky places in the calcareous Alps up to a height of 6000 feet; often in single plants or steep rock-walls, or in thousands on stony declivities, and very high alpine pastures. June—July.

Distribution. — Carpathians; Eastern, Central, and Western Alps; Black Forest; Jura.

PRIMULA FARINOSA L. BIRD'S-EYE PRIMULA.**PRIMULACEÆ.***Plate 90.*

Root-stock slender, premorse, covered with fibres. Leaves all radical, lanceolate-wedge-shaped or obovate-lanceolate, gradually narrowed into a foot-stalk, dentate or nearly entire, obtuse, differing in colour above and below, glabrous on the upper side, densely white-mealy beneath, rolled up when young. Stem erect, leafless, glabrous below, mealy in the upper part like the flower-stalks and calyx. Flowers in a crowded, terminal, many-flowered umbel; involucrel bracts linear, apiculate, saccate at the base. Calyx 5-angled. Capsule longer than calyx.

Stem 3 inches—1 foot high; corolla small, darker or lighter peach-coloured, rarely white, with a yellow eye. Damp meadows from the plains to the alpine region; often in immense abundance, April—May.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Jura. (British).

**GLOBULARIA CORDIFOLIA L. CORDATE
GLOBULARIA.**

GLOBULARIACEÆ.

Plate 91.

Root tapering, branched, putting up branching, prostrate, rooting shoots, which ultimately become woody and knotty. Stem herbaceous, erect or ascending, simple, leafless except one or two scales, like the shoots and leaves glabrous. Leaves of the shoots alternate, crowded; stalked, obovate-lanceolate or spathulate, entire, rounded at the apex, emarginate or 3-toothed. Scales of the stem small, lanceolate, membranous, ciliated. Umbel solitary, flatly hemispherical.

Flowers violet-blue. Gravelly, stony, and dry alpine places, often covering large tracts, and descending to the lower Alps. May—June, or later in high situations.

Distribution.—Eastern, Central, and Western Alps; Jura.

ARMERIA ALPINA L. ALPINE THRIFT.

PLUMBAGINEÆ.

Plate 92.

Root cylindrical, tapering, tufted, with several crowns. Stem erect, simple, leafless, glabrous. Leaves all radical, linear or linear-lanceolate, obscurely 3-nerved, acute, glabrous, not ciliated. Flowers in a terminal hemispherical umbel, surrounded by an involucre; involucral bracts obtuse, the outermost shortly awned; inner ones unarmed.

Stem 3—10 inches high; leaves grass-green; calyx-limb shining, silver-white; flowers lighter or darker peach-colour. Rocks and stony pastures of the calcareous Alps. June—September.

Distribution.—Carpathians; Eastern and Western Alps (British).



DAPHNE ALPINA L. ALPINE DAPHNE.**THYMELACEÆ.***Plate 93.*

Leaves lanceolate or obovate, downy, ultimately glabrous, deciduous. Flowers terminal, crowded, sessile, woolly, appearing at the same time as the leaves. Perianth white; segments lanceolate, acuminate, about one-third shorter than the perianth-tube.

Alpine rocks. May—July.

Distribution.—Carpathians; Eastern, Central, and Western Alps.

POLYGONUM VIVIPARUM L. VIVIPAROUS KNOT-GRASS.**POLYGONACEÆ.***Plate 94.*

Root-stock horizontal, thick, cylindrical, ringed, variously curved. Stem erect, simple, glabrous like the whole plant. Leaves entire, with recurved margin, and crenate from the thickened transverse veins, sea-green beneath; lower leaves elliptical or lanceolate, acute, or obtuse, contracted into a wingless leaf-stalk; upper ones lanceolate or linear-lanceolate, acute, sessile. Flowers in a linear, cylindrical, crowded, erect spike, the lower part of which is composed of bulbils.

Spike slender, comparatively long; perianth white or light flesh-coloured. Rocky alpine and subalpine pastures, descending to the valleys. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura. (British).



ORCHIS GLOBOSA L. GLOBOSE ORCHIS.

ORCHIDEÆ.

Plate 95.

Tubers elliptical, undivided. Stem leafy. Leaves linear or linear-lanceolate. Spike short, conical or nearly globular, compact. Bracts as long as or longer than ovary, 1-nerved, or the lower ones 3-nerved. Labellum 3-cleft: segments linear, middle one somewhat larger, obtuse or truncate, emarginate; spur short, directed downwards, $\frac{1}{3}$ — $\frac{1}{2}$ the length of ovary; remaining 5 perianth-segments terminating in a wedge-shaped point, and approximating into a bell-shaped helmet.

Stem 8—18 inches high, slender; leaves sea-green, not spotted; flowers moderately large, lilac or peach-coloured; labellum spotted with purple. Common in alpine and subalpine pastures. May—July.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Black Forest; Vosges; Jura.

NIGRITELLA ANGUSTIFOLIA L. NARROW-LEAVED ORCHIS.

ORCHIDEÆ.

Plate 96.

Tubers palmately divided. Stem nearly naked above. Leaves narrowly linear, finely ciliated; the lower ones crowded; upper ones further apart and much smaller. Spike conical or ovate, dense-flowered. Bracts as long as or longer than perianth. Labellum ovate, apex acuminate, entire or slightly crenate; spur very short, obovate, much shorter than ovary; remaining perianth-leaves lanceolate, acuminate.

Stem 3—8 inches high; leaves grass-like, 1—2 lines broad; flowers small, like the bracts dark carmine or purple, with the odour of vanilla. Alpine and subalpine pastures, from 2000—6000 feet. June—August.

Distribution.—Carpathians; Eastern, Central, and Western Alps; Jura.

GYMNADENIA CONOPSEA L. SWEET-SCENTED ORCHIS.

ORCHIDEÆ.

Plate 97.

Tubers palmately divided. Stem leafy. Leaves lanceolate or linear-lanceolate; the upper ones often very small, sheathing. Spike cylindrical, dense-flowered. Bracts 3-nerved, as long as or longer than the ovary. Labellum 3-partite; lobes undivided, nearly alike, obtuse or the middle one acute; spur filiform, bent downwards, $1\frac{1}{2}$ —2 times as long as ovary; remaining perianth-leaves obtuse, the 3 upper ones approximate, forming a helmet, the two lateral ones spreading or reflexed.

Variable both in the colour of the perianth and in the size of the seporate parts; perianth usually purple; lighter or darker, or various shades of violet, seldom white, with a slight scent of vanilla. Alpine and subalpine pastures and meadows, common, as well as at lower altitudes. June—July.

Distribution. — Carpathians; Germany; Holland; Belgium; Eastern, Central, and Western Alps. (British).

CYPRIPEDIUM CACEOLUS L. LADIES' SLIPPER.

ORCHIDEÆ.

Plate 98.

Root-stock cylindrical, knotty, horizontal, tufted, with fleshy fibres. Stem downy, 1—2-flowered. Leaves elliptical or ovate-lanceolate, acute, glabrous above, downy on the under side and margin. Bracts similar to stem-leaves, but smaller. Labellum net-veined; remaining perianth-leaves spreading; the two outer ones ovate-lanceolate, upper acuminate, lower 2-partite; the two inner lateral ones linear-lanceolate, acute, usually twisted.

Stony bushy alpine and subalpine places; not a true alpine plant. May—June.

Distribution. — Carpathians; Eastern, Central, and Western Alps. (British).

NARCISSUS POETICUS L. POET'S NARCISSUS.**AMARYLLIDÆ.***Plate 99.*

Bulb ovate. Leaves all radical, linear, obtuse, glabrous like the whole plant. Scape erect, 2-angled, 1-flowered. Corona bowl-shaped, crenate at the margin, much shorter than the perianth-leaves.

Scape 1 foot high; flower white. Subalpine meadows and valleys. April—June.

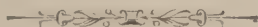
Distribution. — Carpathians; Eastern, Central, and Western Alps.

AGROSTIS RUPESTRIS ALL. ROCK BENT-GRASS.**GRAMINÆ.***Plate 100.*

Root-stock tufted, covered with fibres. Haulm erect or ascending, bent at the nodes, glabrous like the whole plant. Root-leaves crowded, bristly; stem-leaves similar or flat, linear; ligule narrow, projecting. Panicle ovate or elliptical, spreading; branches smooth; spikelets ovate-lanceolate. Glumes nearly equal in length. Paleæ 1 or 2, upper one mostly wanting, lower one awned below the middle, awn twice as long as pale.

Alpine meadows and pastures. July—August.

Distribution.—Carpathians; Erzgebirge; Eastern, Central, and Western Alps; Black Forest; Jura.







Aragone alpina L.





Anemone Halleri All.



Anemone narcissiflora L.





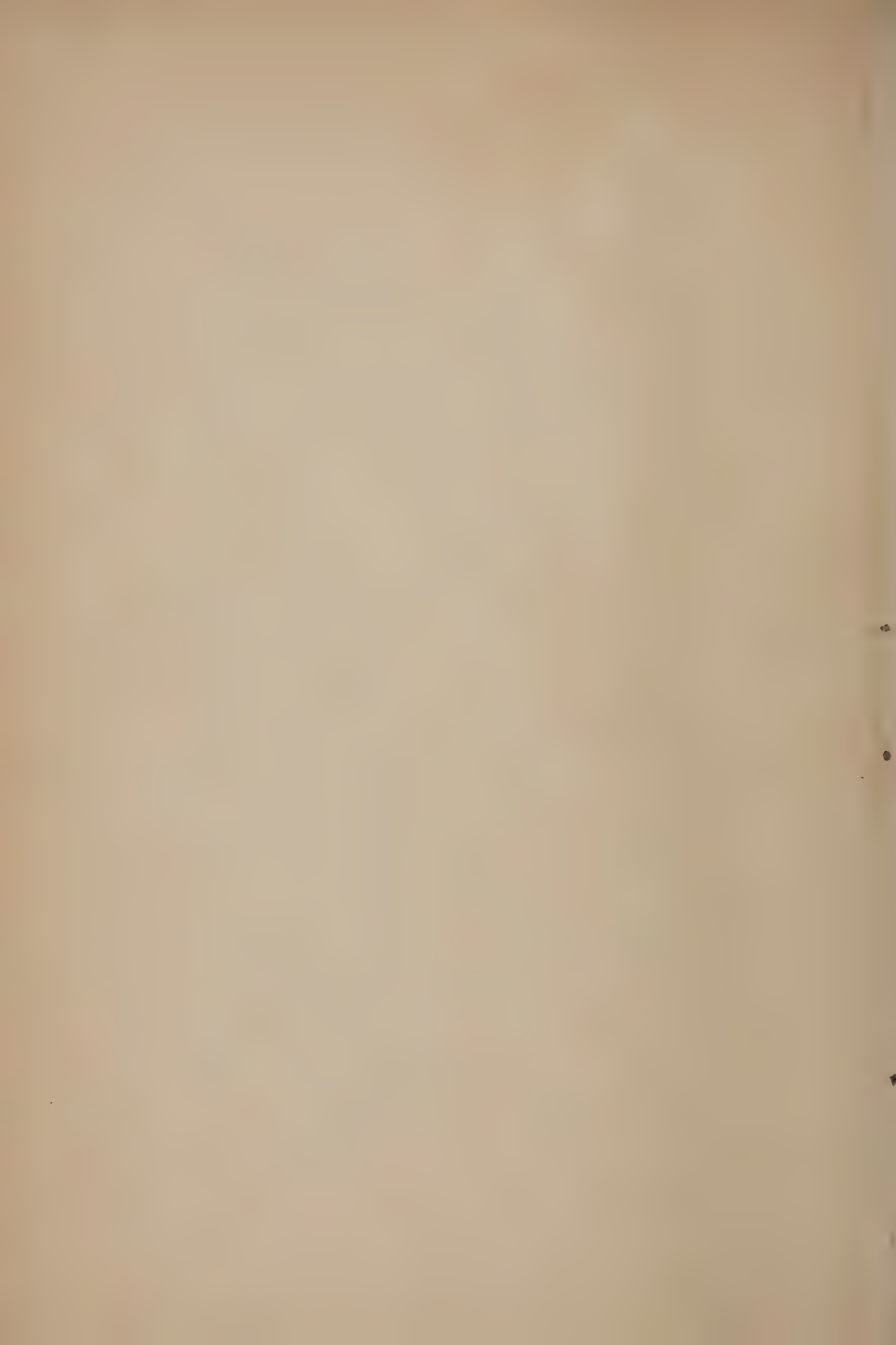
Anemone alpina L.



Ranunculus Trausenfolieneri Hoppe.



Ranunculus pyrenaeus L.





Ranunculus montanus Willd.



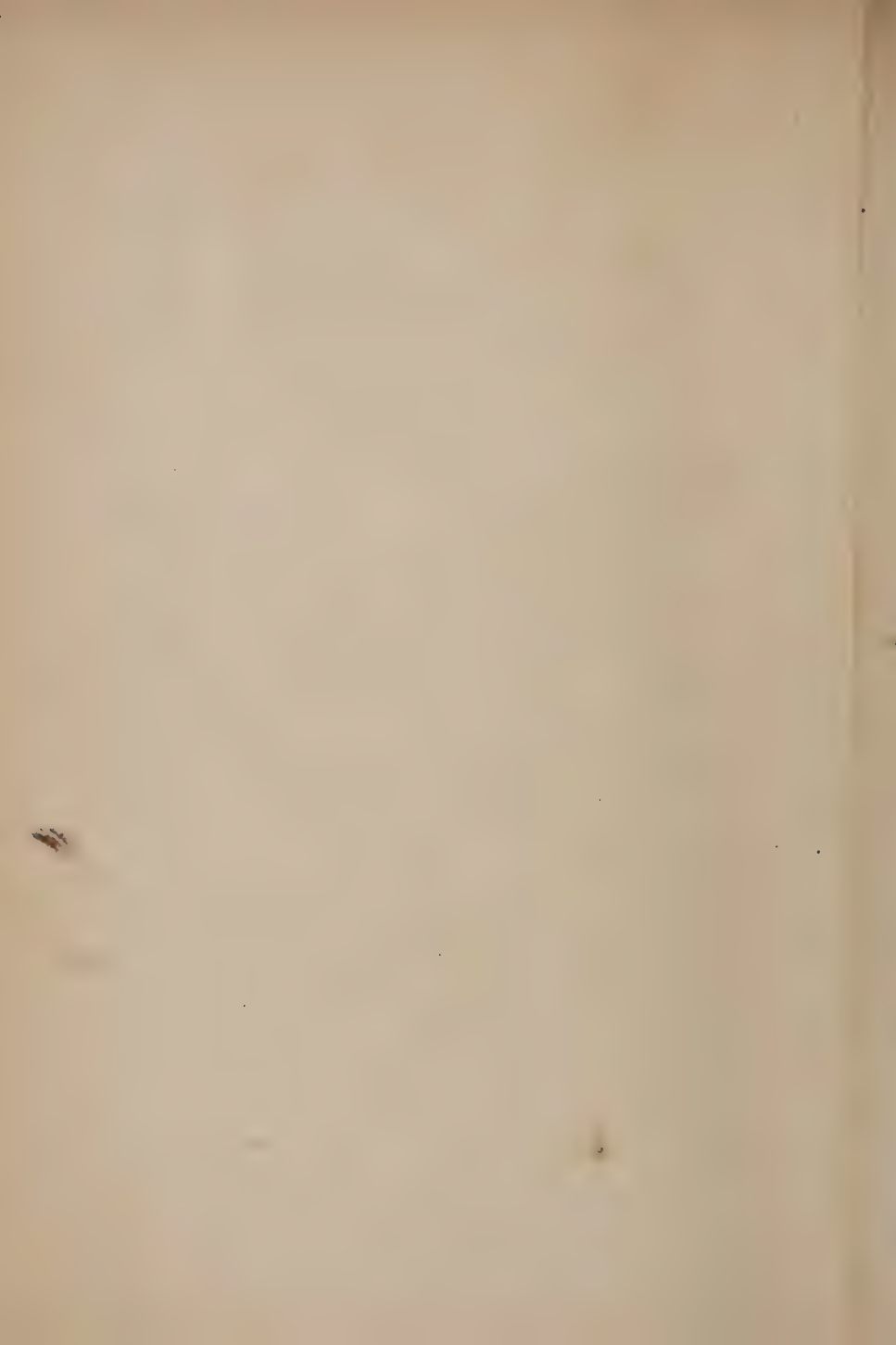
Trollius europaeus L.



Aquilegia pyrenaica L'Her.

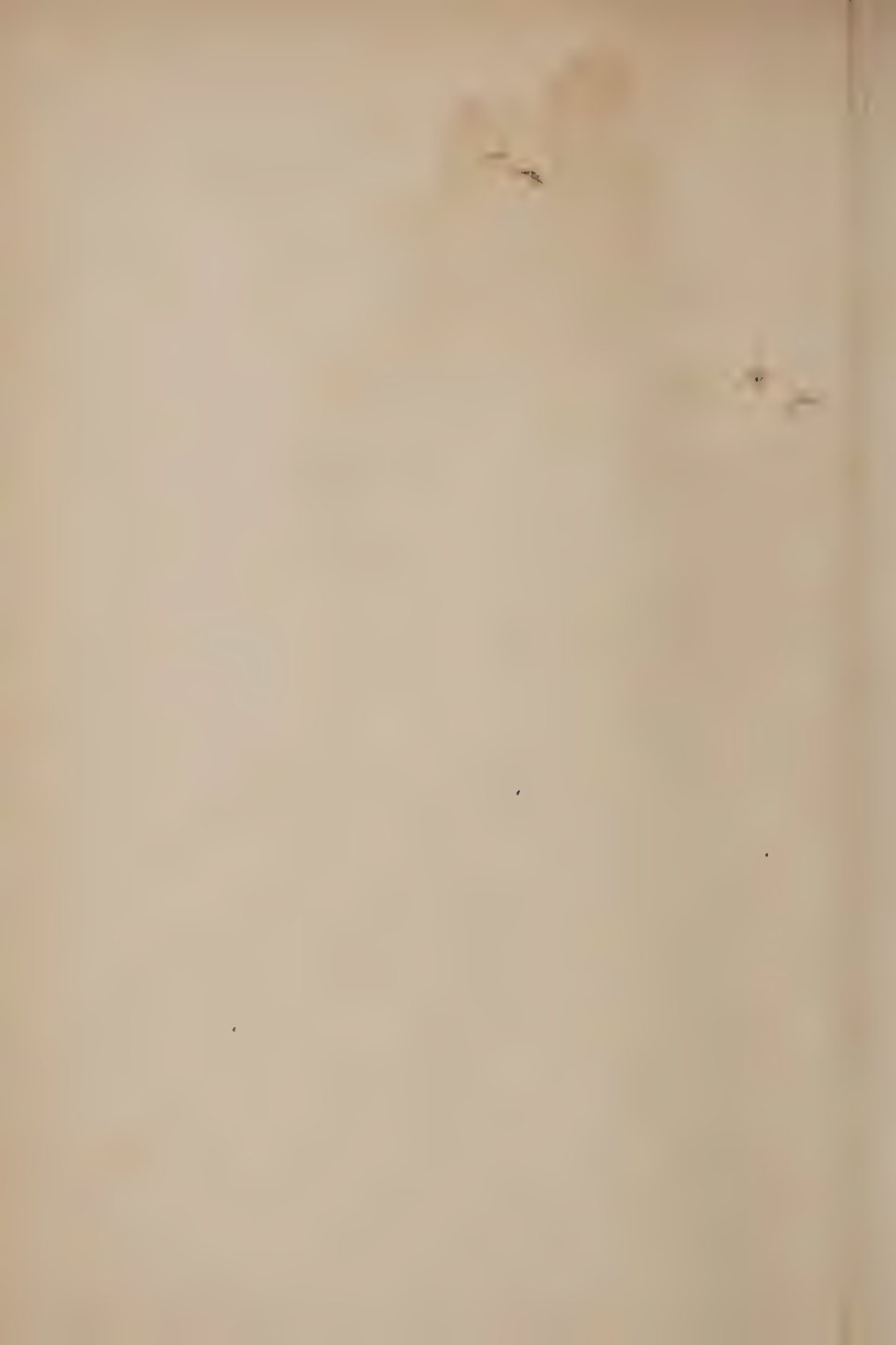


Helleborus niger L.





Aconitum Anthora L.





Aconitum. Napellus L.



Papaver alpinum L.



Arabis alpina L.



Arabis pumila - Tacy



Thlaspe rotundifolium Gaud.



Hutchinsia alpina. R. Br.



Viola lutea Lm.



Viola alpina Jacq.



Gypsophila repens L.



Dianthus alpinus L.



Silene acaulis L.



Silene rupestris L.



Hebevirgata muscosa L.



Thapsa frigida L.



Corydalis montana D.C.





Cystopteris campestris S. C.



Dryas octopetala L.





Potentilla aurea L.



Potentilla caulescens L.



Rosa alpina L.





Alchemilla pubescens. Rich.



Alchemilla alpina L.



Lemniscata hirtum L.



Saxifraga oppositifolia L.



Saxifraga cespitosa L



Saxifraga Seguieri Spr.



Saxifraga stellaris L.



Taraxacum officinale L.



Bupleurum graminifolium Vahl.



Valeriana celtica. Turcz.



Valeriana saxatilis L.



Teutissa lucida Vahl.



Adenostyles alpina - Bl.



Aster alpinus L.



Bellidiastrum Michelii Cass.



Erigeron alpinus L.



Gnaphalium
Leontopodium

Gnaphalium Leontopodium L.



Artemisia Mutellina Vill.



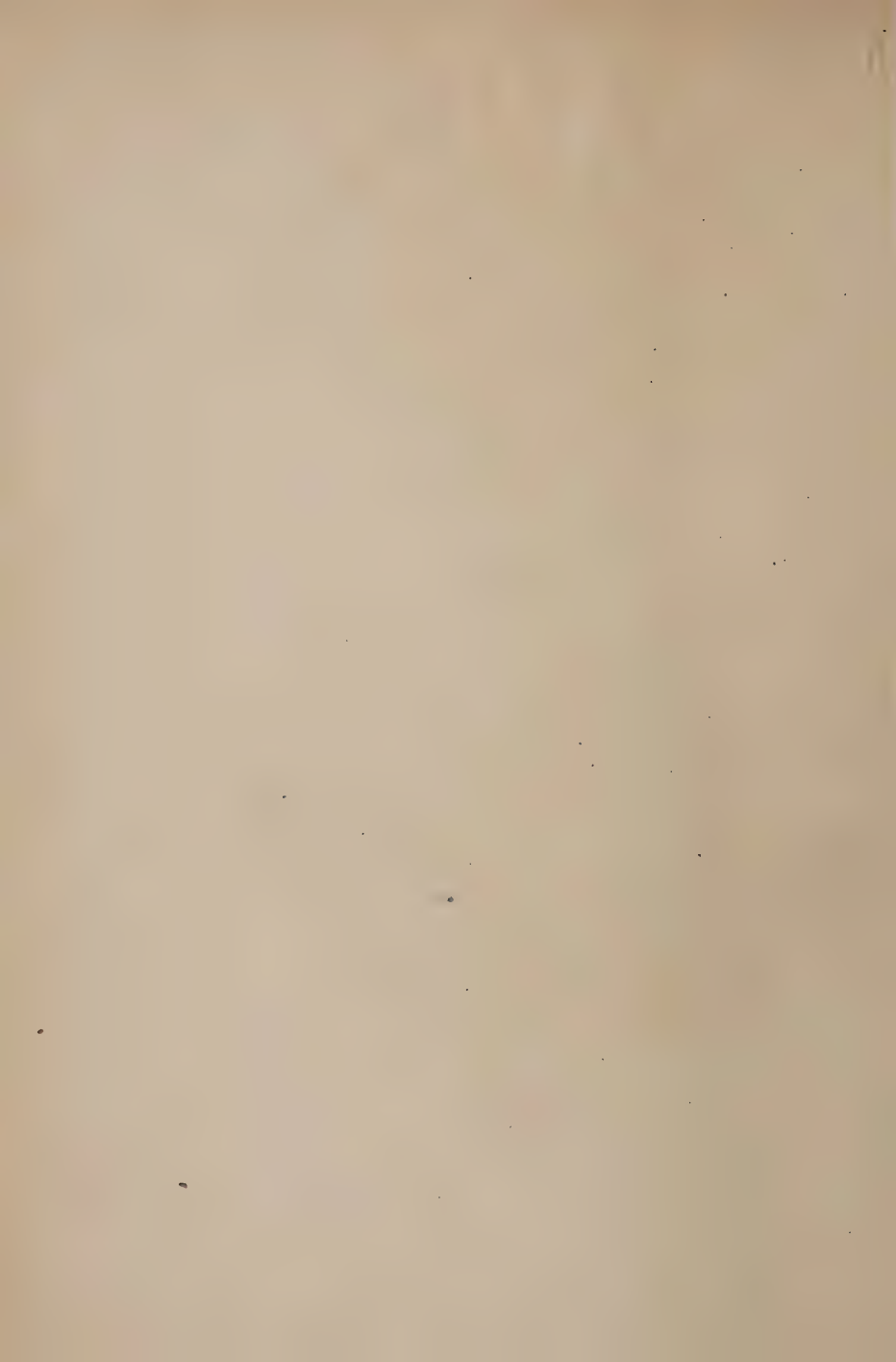
Achillea Clavenae L.



Achillea nanca L.



Aronicum Elusii - Koch.





Arnica montana L.



Centaurea montana L.



Mulgedium alpinum



Leontodon pyrenaicus Gouan.



Hieracium aurantiacum L.





Hieracium staticefolium Vill.



Hieracium villosum Jacq.



Phyleuma pauciflorum L.



Campanula barbata L.





Campanula pulla L.





Campanula pusilla Haenk.



Azalea procumbens L.



Rhododendron ferrugineum L.



Rhododendron hirsutum L.



Pyrola uniflora L.



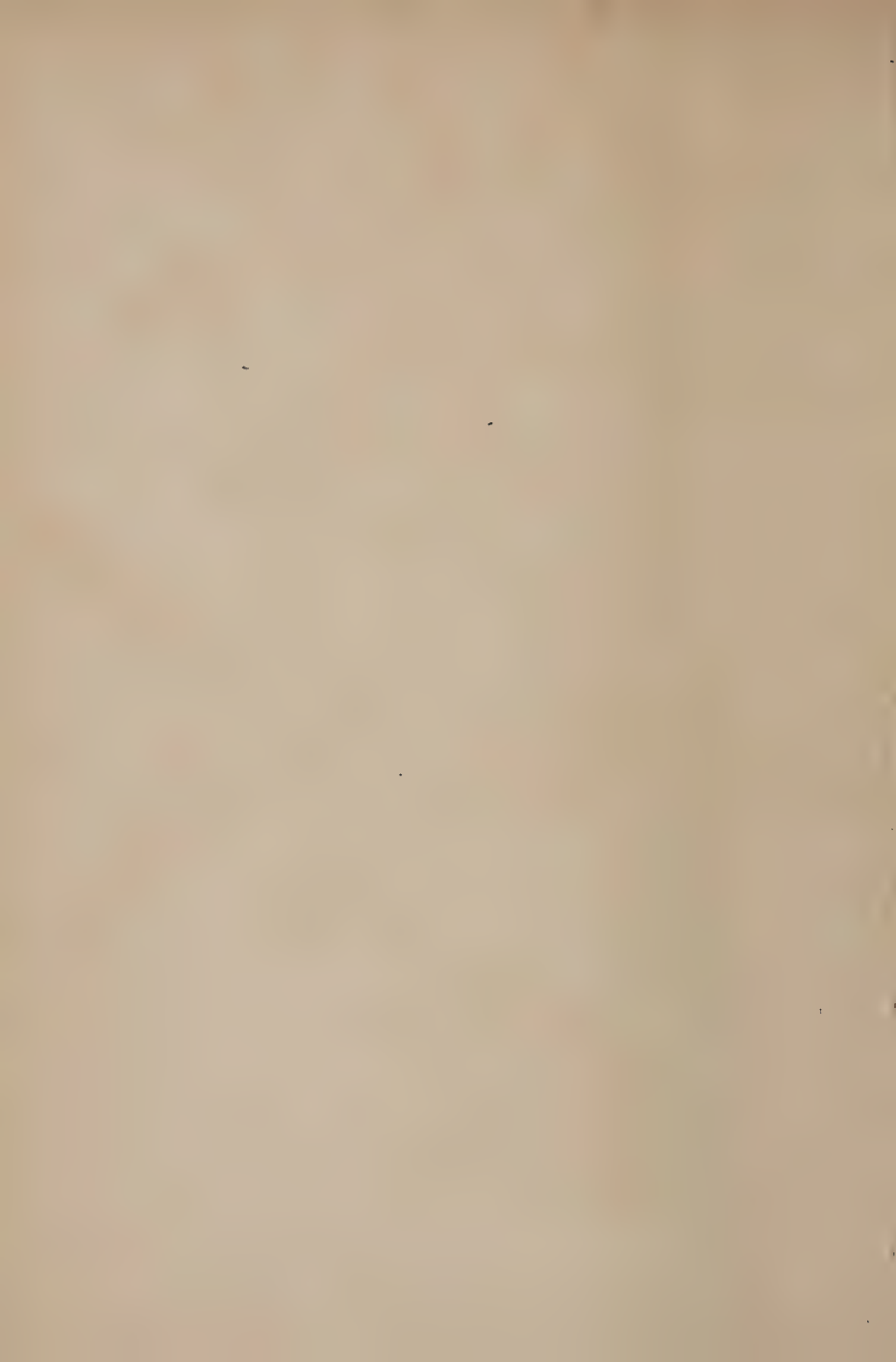
Pyrola rotundifolia L.



Gentiana purpurascens L.



Gentiana punctata L.





Gentiana asclepiadea L.



Gentiana arcaulis L.



Gentiana bavarica L.



Gentiana verna L.



Gentiana atropurpurea Willd.



Linaria alpina - Mill.



Pedicularis verticillata L.



Primula alpinus L.





Pinguicula alpina L.



Pinguicula vulgaris L.



Androsace Chamacjasma. West.



Androsace lactea L.





Androsace obtusifolia. Willd.



Soldanella alpina L.



Soldanella pusilla Baumg.



Cortusa Matthioli L.



Primula spectabilis
Tratt



Primula villosa . Jacq.



Primula auricula L.

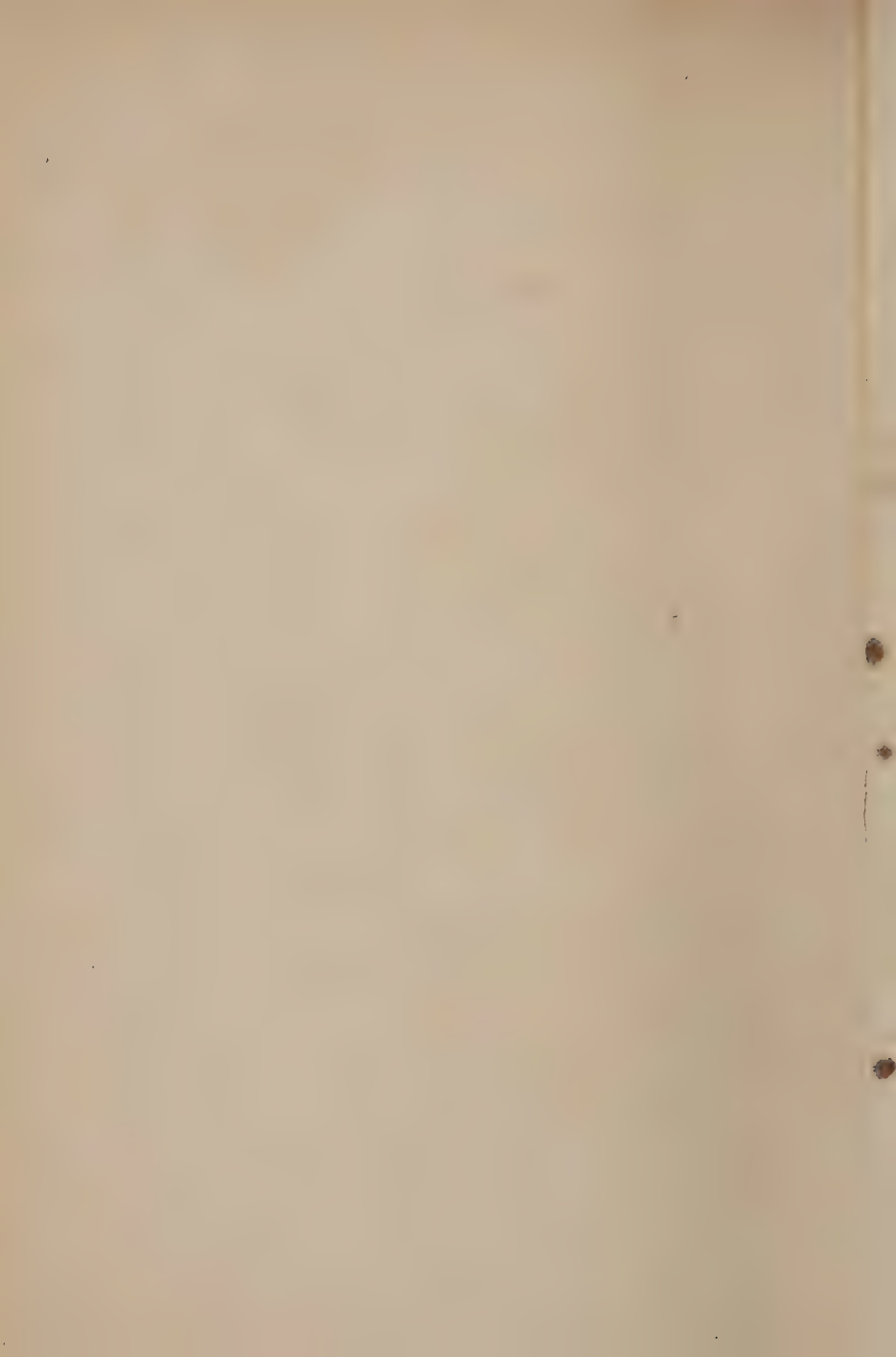


Primula farinosa L.





Globularia cordifolia L.





Armeria alpina. L.



Daphne alpina L.





Polygnum viviparum L.

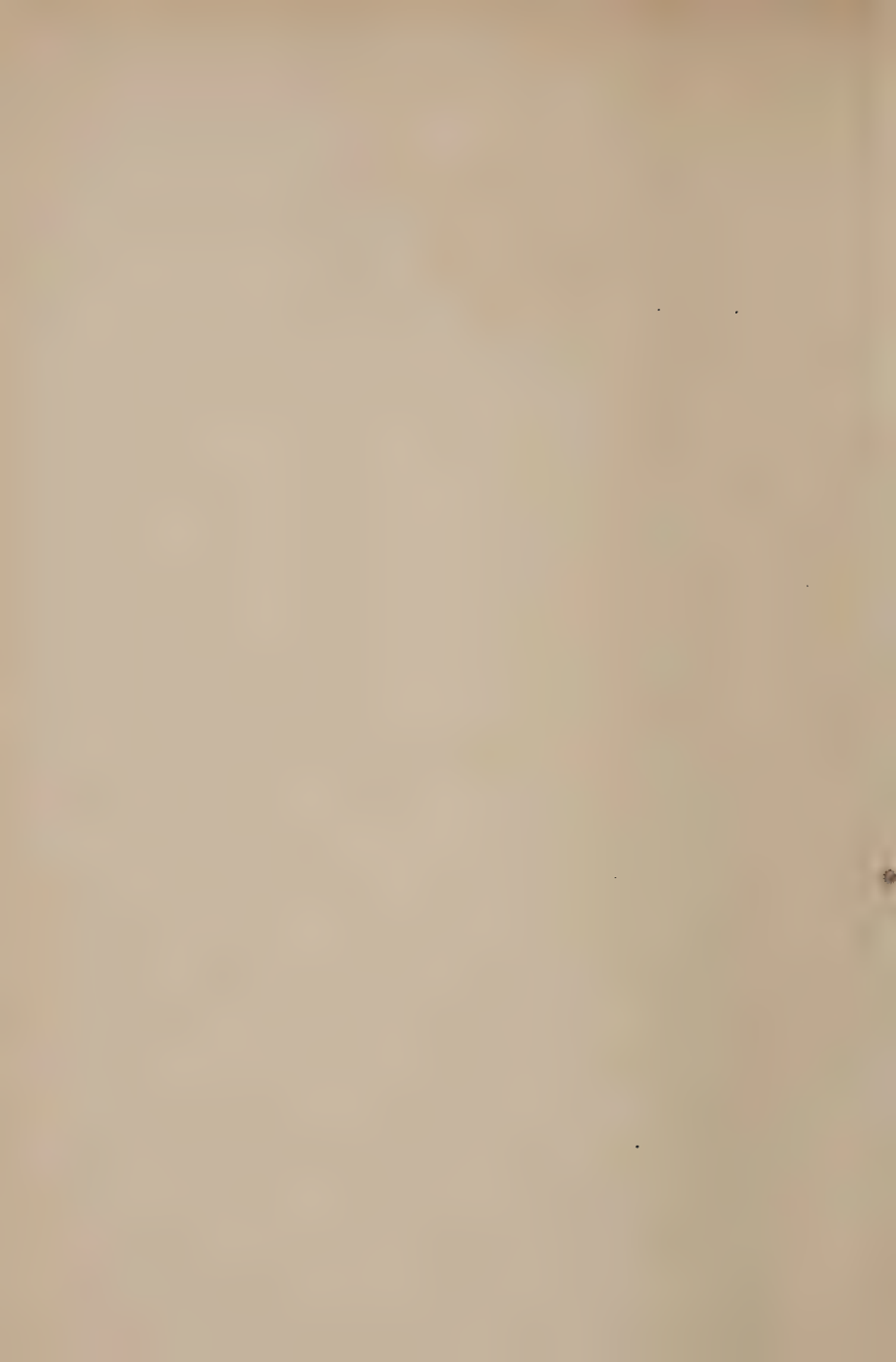


Cichis globosa L.



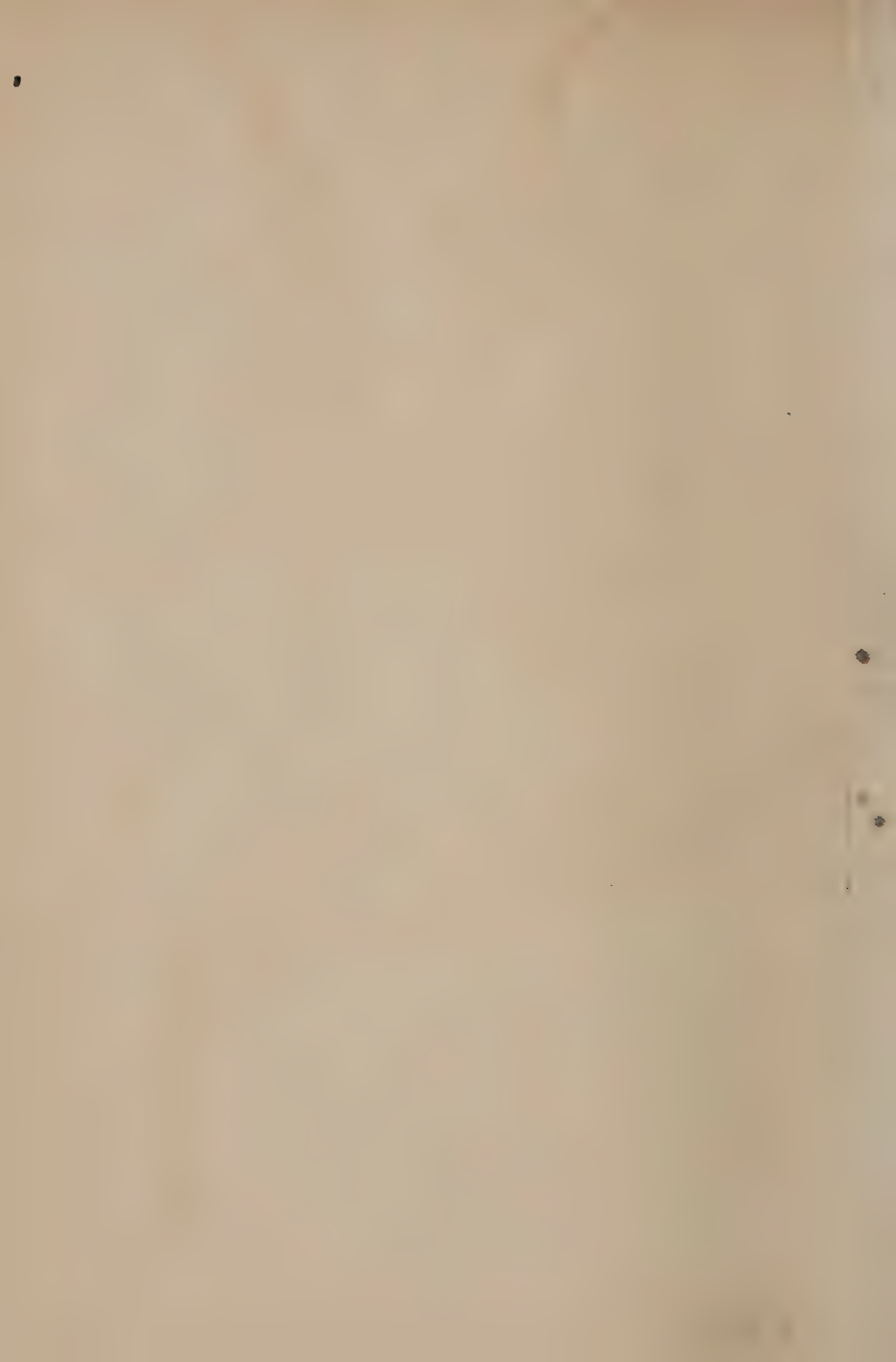


Nigritella angustifolia Rich.



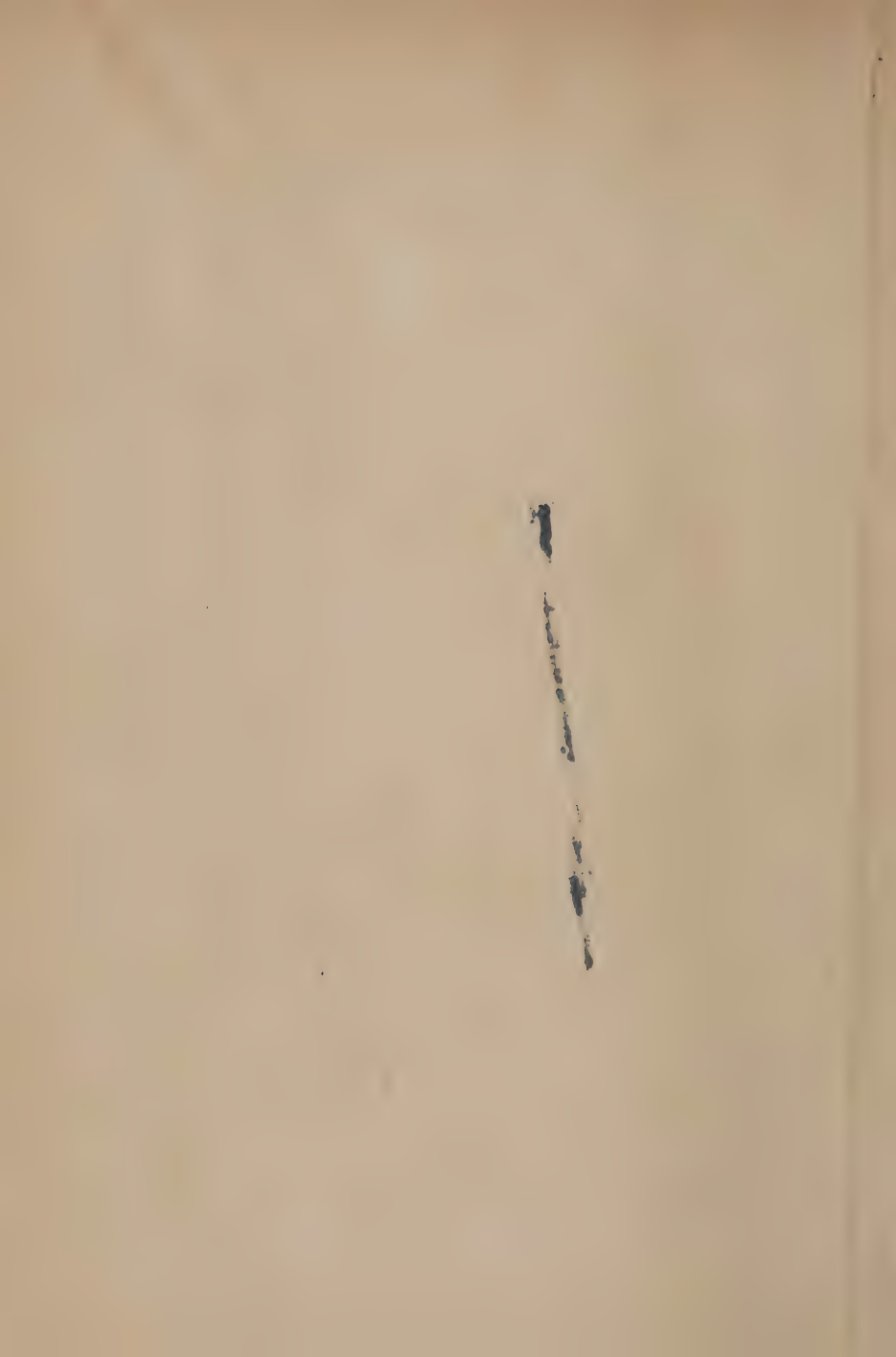


Gymnadenia conopsea - R. Br.





Cypripedium Calceolus L.





Narcissus poeticus L.



Lygostis rupestris. III



INDEX TO THE LATIN NAMES.

<i>Achillea Clavenae</i> ..	12, 14, 42	<i>Arabis alpina</i> ..	8, 14, 24
<i>Achillea nana</i> ..	14, 43	<i>Arabis bellidifolia</i> ..	14
<i>Aconitum Anthora</i> ..	14, 23	<i>Arabis ciliata</i> ..	14
<i>Aconitum Napellus</i> ..	14	<i>Arabis cœrulea</i> ..	14
<i>Aconitum variegatum</i>	14, 23	<i>Arabis pumila</i> ..	14, 25
<i>Acrostichum Marantae</i>	14	<i>Arabis vochinensis</i> ..	14
<i>Adenostyles albifrons</i>	14	<i>Acertostaphylos officinalis</i>	13, 14
<i>Adenostyles alpina</i> ..	14, 39	<i>Arenaria ciliata</i> ..	12
<i>Agrostis rupestris</i> ..	14, 67	<i>Armeria alpina</i> ..	9, 14, 63
<i>Aguilegia Pyrenaica</i> ..	22	<i>Arnica montana</i> ..	14, 44
<i>Ajuga pyramidalis</i> ..	14	<i>Aronicum Clusii</i> ..	43
<i>Alchemilla alpina</i> ..	14, 34	<i>Artemisia mutellina</i>	12, 13, 14, 42
<i>Alchemilla fissa</i> ..	14	<i>Aster alpinus</i> ..	14, 40
<i>Alchemilla pentaphylla</i>	14	<i>Astragalus purpureus</i> ..	14
<i>Alchemilla pubescens</i>	14, 33	<i>Astrantia carniolica</i> ..	14
<i>Allosorus crispus</i> ..	14	<i>Astrantia major</i> ..	14
<i>Alnus viridis</i> ..	14	<i>Athamanta cretensis</i> ..	14
<i>Alsine austriaca</i> ..	14	<i>Atragene alpina</i> ..	14, 18
<i>Alsine Gerardi</i> ..	14	<i>Avena alpestris</i> ..	14
<i>Alsine laricifolia</i> ..	14	<i>Azalea procumbens</i>	5, 6, 14, 49
<i>Alyssum Wulfenianum</i>	14	<i>Bellidiastrum Michellii</i>	14, 40
<i>Androsace Chamæjasme</i>	14, 58	<i>Betonica Alopecuros</i> ..	14
<i>Androsace lactea</i> ..	14, 58	<i>Betula nana</i> ..	8
<i>Androsace obtusifolia</i>	14, 59	<i>Braya alpina</i> ..	5
<i>Androsace villosa</i> ..	14	<i>Bupleurum graminifolium</i> ..	14
<i>Anemone alpina</i> ..	14, 19	<i>Calamintha alpina</i> ..	14
<i>Anemone baldensis</i> ..	14	<i>Campanula alpina</i> ..	14
<i>Anemone Halleri</i> ..	12, 14, 18	<i>Campanula barbata</i> ..	14, 48
<i>Anemone narcissiflora</i>	14, 19	<i>Campanular pulla</i> ..	14, 48
<i>Anemone vernalis</i> ..	12, 14	<i>Campanula pusilla</i> ..	49
<i>Aquilegia Bauhini</i> ..	14	<i>Campanula rotundifolia</i>	15

<i>Campanula thyrsoidea</i> ..	15	<i>Erica carnea</i>	15
<i>Cardamine alpina</i>	15	<i>Erigeron alpinus</i> ..	15, 41
<i>Cardamine resedifolia</i> ..	15	<i>Erinus alpinus</i> ..	15, 56
<i>Carex atrata</i>	15	<i>Eriophorum alpinum</i> ..	15
<i>Carex baldensis</i>	15	<i>Eryngium alpinum</i> ..	15
<i>Centaurea alpina</i>	15	<i>Festuca alpina</i>	15
<i>Centaurea montana</i>	44	<i>Festuca pumila</i>	15
<i>Cerastium alpinum</i>	15	<i>Gentiana acaulis</i> ..	15, 53
<i>Cerastium lanatum</i> ..	12, 13, 15	<i>Gentiana asclepiadea</i>	15, 53
<i>Cerastium latifolium</i> ..	15	<i>Gentiana bavarica</i> ..	15, 54
<i>Cherleria sedoides</i>	6	<i>Gentiana obtusifolia</i> ..	55
<i>Cineraria aurantiaca</i> ..	15	<i>Gentiana pannonica</i> ..	52
<i>Cirsium acaule</i>	15	<i>Gentiana punctata</i> ..	52
<i>Cirsium spinosissimum</i> ..	15	<i>Gentiana verna</i> ..	15, 54
<i>Coeloglossum viride</i> ..	15	<i>Geranium argenteum</i>	12, 15
<i>Convallaria verticillata</i> ..	15	<i>Geranium macrorrhizum</i> ..	15
<i>Cortusa Matthioli</i> ..	5, 12, 60	<i>Geum montanum</i>	15
<i>Crocus vernus</i>	15	<i>Globularia cordifolia</i>	5, 6, 15, 63
<i>Cyclamen europæum</i> ..	12	<i>Globularia nudicaulis</i> ..	15
<i>Cypripedium Calceolus</i>	15, 66	<i>Gnaphalium Leontopodium</i>	15, 41
<i>Cytisus alpinus</i>	15	<i>Gymnadenia albida</i>	15
<i>Daphne alpina</i>	8, 15, 64	<i>Gymnadenia conopsea</i>	15, 66
<i>Daphne Blagayana</i> ..	12, 13, 15	<i>Gypsophila repens</i> ..	8, 15, 27
<i>Daphne striata</i>	15	<i>Hedysarum obscurum</i> ..	15
<i>Delphinium elatum</i>	15	<i>Helianthemum oelandicum</i>	12
<i>Dianthus alpinus</i>	15, 28	<i>Helleborus niger</i>	8, 15, 22
<i>Dianthus glacialis</i>	15	<i>Hieracium albidum</i>	15
<i>Doronicum austriacum</i> ..	15	<i>Hieracium alpinum</i> ..	15
<i>Draba aizoides</i>	5, 12, 15	<i>Hieracium aurantiacum</i>	15, 46
<i>Draba ciliata</i>	15	<i>Hieracium porrifolium</i> ..	46
<i>Draba Joannis</i>	15	<i>Hieracium staticifolium</i> ..	15
<i>Draba stellata</i>	15	<i>Hieracium villosum</i> ..	15, 47
<i>Draba tomentosa</i>	12, 15	<i>Homogyne alpina</i>	15
<i>Draba Zahlbruckneri</i> ..	15	<i>Homogyne discolor</i>	15
<i>Dryas octopetala</i>	5, 15, 31	<i>Homogyne sylvestris</i> ..	15
<i>Epilobium alpinum</i>	15	<i>Horminum pyrenaicum</i> ..	15
<i>Epimedium alpinum</i>	15	<i>Hutchinsia alpina</i> ..	15, 26

<i>Juniperus nana</i>	13	<i>Pinguicula vulgaris</i> ..	16, 57
<i>Kernera saxatilis</i>	15	<i>Pinus Cembra</i>	16
<i>Leontodon pyrenaicum</i>	15, 45	<i>Pinus Mughus</i> ..	5, 16
<i>Linaria alpina</i> ..	15, 55	<i>Pinus Pumilio</i>	8
<i>Linnaea borealis</i> ..	13, 15	<i>Polygala Chamæbuxus</i>	.. 16
<i>Linum alpinum</i>	15	„ var. <i>purpurea</i>	.. 16
<i>Lonicera alpigena</i>	15	<i>Polygonum viviparum</i>	16, 61
<i>Lychnis alpina</i>	15	<i>Potentilla aurea</i> ..	16, 32
<i>Meum athamanticum</i> ..	15	<i>Potentilla caulescens</i>	16, 32
<i>Meum mutellina</i>	15	<i>Potentilla Clusiana</i> 16
<i>Möhringia muscosa</i> ..	15, 29	<i>Potentilla frigida</i> 16
<i>Möhringia Ponae</i> ..	12, 16	<i>Potentilla grandiflora</i>	.. 16
<i>Mulgedium alpinum</i>	16, 45	<i>Potentilla multifida</i> 16
<i>Myosotis alpestris</i>	16	<i>Potentilla nitida</i>	16
<i>Narcissus poeticus</i> ..	16, 67	<i>Potentilla nivea</i>	16
<i>Nigritella angustifolia</i>	16, 65	<i>Primula Auricula</i> ..	12, 16, 62
<i>Orchis globosa</i> ..	16, 65	<i>Primula calycina</i>	16
<i>Orchis incarnata</i>	16	<i>Primula commutata</i> 16
<i>Orchis maculata</i>	16	<i>Primula farinosa</i> ..	16, 62
<i>Orchis sambucina</i>	16	<i>Primula integrifolia</i> 16
<i>Orobis luteus</i>	16	<i>Primula longiflora</i> 16
<i>Oxyria digyna</i>	16	<i>Primular marginata</i> 12
<i>Oxytropis campestris</i>	16, 31	<i>Primular minima</i>	16
<i>Oxytropis montana</i> ..	16, 30	<i>Primula pubescens</i> 16
<i>Papaver appinum</i> ..	16, 24	<i>Primula spectabilis</i> ..	16, 61
<i>Paradisia Liliastrum</i>	.. 16	<i>Primula villosa</i> ..	16, 61
<i>Pedicularis verticillata</i>	5, 56	<i>Pyrola rotundifolia</i> 51
<i>Petrocallis pyrenaica</i>	.. 16	<i>Pyrola uniflora</i>	51
<i>Phaca frigida</i>	16, 30	<i>Ranunculus</i>	5
<i>Phleum alpinum</i>	16	<i>Ranunculus aconitifolius</i>	.. 16
<i>Phyteuma comosum</i> ..	16	<i>Ranunculus alpestris</i>	.. 16
<i>Phyteuma confusum</i> Kerner	47	<i>Ranunculus glacialis</i>	5, 16
<i>Phyteuma hemisphaericum</i>	16	<i>Ranunculus hybridus</i>	.. 16
<i>Phyteuma Michellii</i>	16	<i>Ranunculus montanus</i>	.. 21
<i>Phyteuma pauciflorum</i>	.. 16	<i>Ranunculus parnassifolius</i>	.. 16
<i>Phyteuma Scheuchzeri</i>	.. 16	<i>Ranunculus pyrenæus</i>	.. 20
<i>Pinguicula alpina</i> ..	16, 57	<i>Ranunculus rutæfolius</i>	.. 16

Ranunculus Thora 16	Sempervivum montanum .. 17
Ranunculus Traunfellneri 16, 20	Sempervivum Pittonii .. 17
Rhamnus alpina .. 13, 33	Sempervivum tectorum .. 17
Rhododendron Chamæcistus 10, 16	Sempervivum tomentosum 17
„ ferrugineum 6, 16, 50	Sempervivum Wulfenii .. 17
Rhododendron hirsutum 6, 16, 50	Senecio abrotanifolius .. 17
Rosa alpina 16	Senecio incanus 17
Salix arbuscula 16	Silene acaulis .. 10, 17, 28
Salix herbacea 16	Silene alpestris .. 12, 17
Salix Myrsinites 16	Silene Pumilio .. 6, 13, 17
Salix reticulata 16	Silene quadrifida 17
Salix retusa 16	Silene rupestris 29
Saxifraga aizoides .. 16, 37	Silene Saxifraga .. 12, 17
Saxifraga Aizoon .. 12, 16	Soldanella alpina .. 5, 17, 59
Saxifraga biflora 16	Soldanella minima 17
Saxifraga bryoides 16	Soldanella pusilla .. 17, 60
Saxifraga Burseriana .. 16	Thalictrum alpinum .. 17
Saxifraga caesia .. 12, 16, 35	Thalictrum aquilegifolium .. 17
Saxifraga caespitosa 16	Thalictrum foetidum .. 17
Saxifraga crustata 16	Thlaspi alpinum .. 12, 17
Saxifraga cuneifolia 16	Thlaspi rotundifolium 17, 25
Saxifraga elatior .. 12, 16	Trifolium badium 17
Saxifraga hypnoides .. 8, 16	Trollius europaeus .. 8, 17, 21
Saxifraga muscoides 17, 36	Tunica Saxifraga 12
Saxifraga mutata 17	Valeriana celtica .. 17, 38
Saxifraga oppositifolia 17, 35	Valeriana montana 17
Saxifraga pyramidalis .. 12	Valeriana saxatilis .. 17, 38
Saxifraga rotundifolia 5, 12, 17	Valeriana supina 17
Saxifraga sedoides 17	Valeriana tripteris 17
Saxifraga Seguieri 17	Veronica alpina 17
Saxifraga squarrosa 17	Veronica bellidifolia .. 17
Saxifraga stellaris .. 5, 17, 36	Veronica saxatilis .. 12, 17
Saxifraga tenella .. 12, 17	Viola alpina 17, 27
Seabiosa lucida .. 17, 39	Viola biflora 17
Sempervivum arachnoideum 17	Viola lutea 17, 26
Sempervivum Funkii .. 17	Wulfenia carinthiaca 9, 17
Sempervivum hirtum 17, 34	Zahlbrucknera paradoxa .. 17

SEP 29 1893

R SEP 30

R SEP 30

S. MAR 25

M. R. APR 30

HALF USE

